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VVKIEPLGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLR

AIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMT

WMEWEREISNYTDIIYRLIEESQNQQEKNEQELLALDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRI

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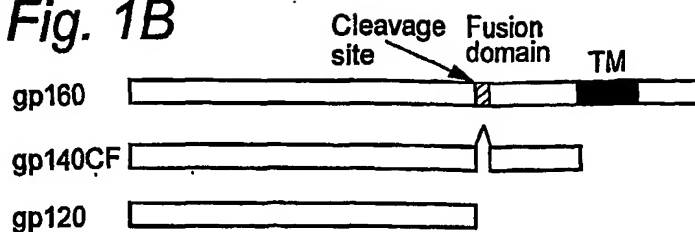
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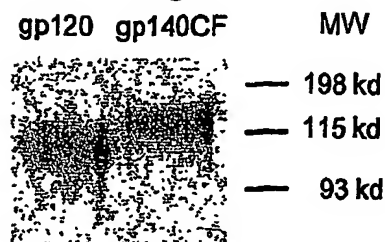Fig. 1A

Fig. 1B

Fig. 1C

Fig. 1D

CON6.env (group M env consensus. This one contain five variable regions in env gene from 98CN006 virus, not in the public domain yet)

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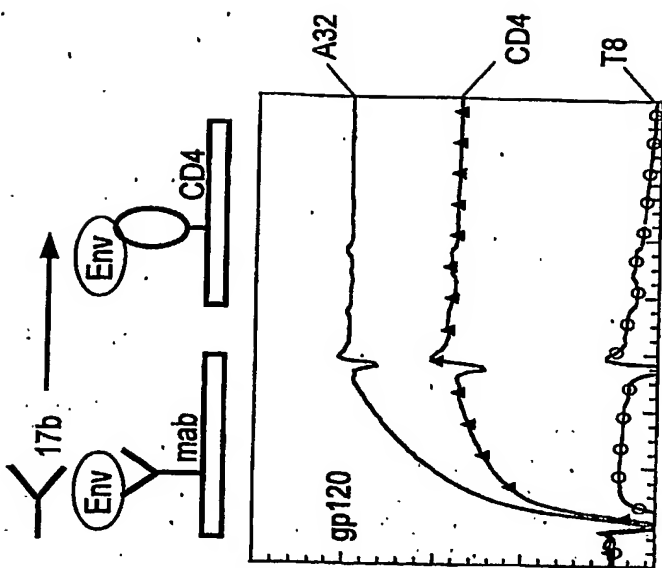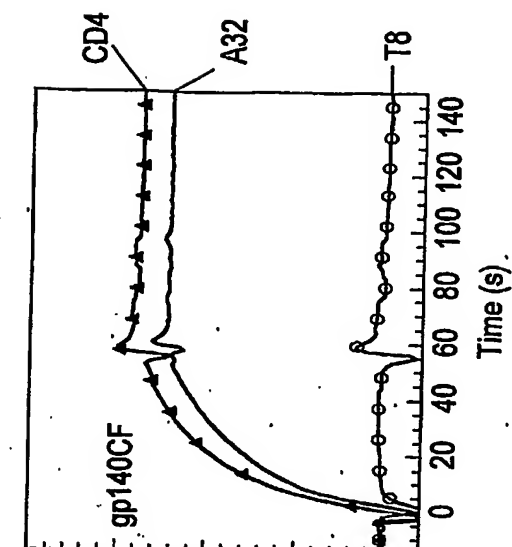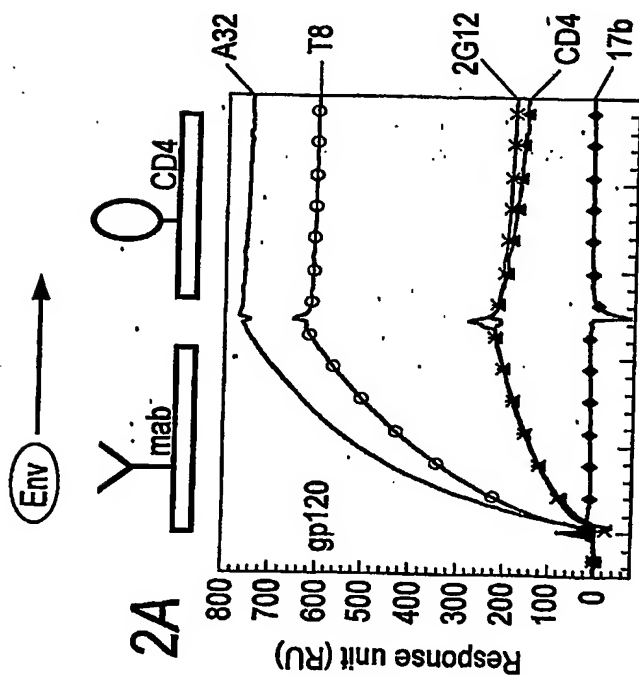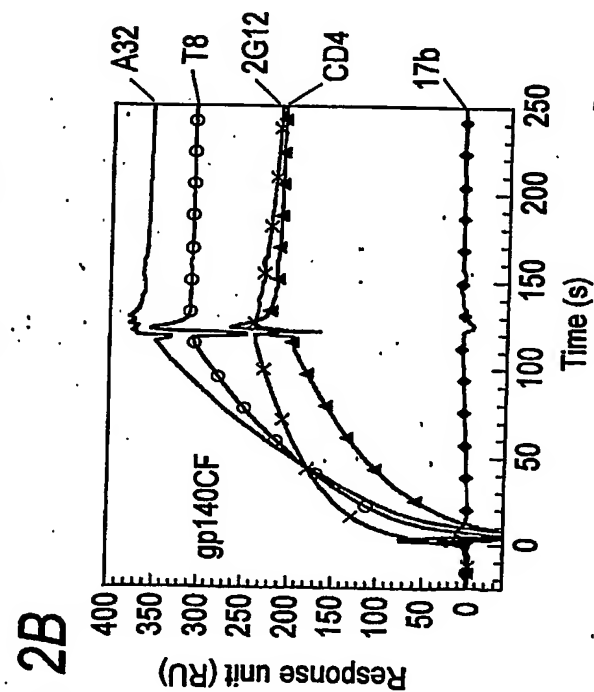
Fig. 2A

Fig. 2B

Fig. 2C

Fig. 2D

Fig. 2E

Fig. 3A

Fig. 3B

Fig. 4

Fig. 5

Fig. 6A

C.anc.env (subtype C ancestral env. The amino acid sequence is
different from Los Alamos Database August 2002)

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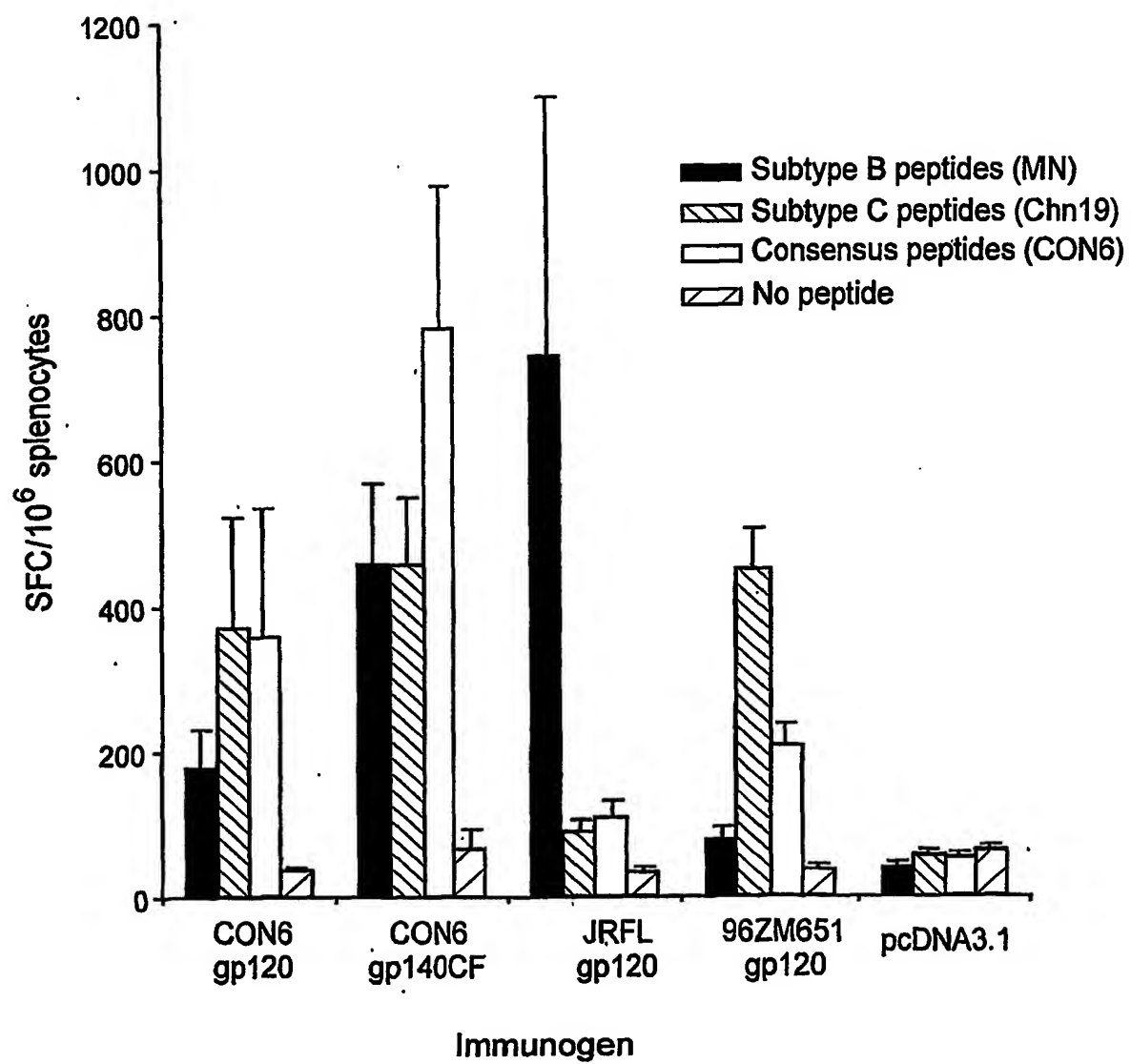
Fig. 6B

C.con.env (subtype C consensus env. The amino acid sequence
is different from Los Alamos Database August 2002)

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C.anc.env (subtype C ancestral env)

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Fig. 6C

C.con.env (subtype C consensus env)

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LQ

Fig. 6D

Fig. 6E

Synthesize entire gene in 80-mer fragments overlapping by 20 residues
at the 3' end with invariant sequences at the 5' end.

EcoRI   BbsI

80mer fragment

BsmBI   BamHI

80mer fragment

Invariant Seq.
(18 nt)
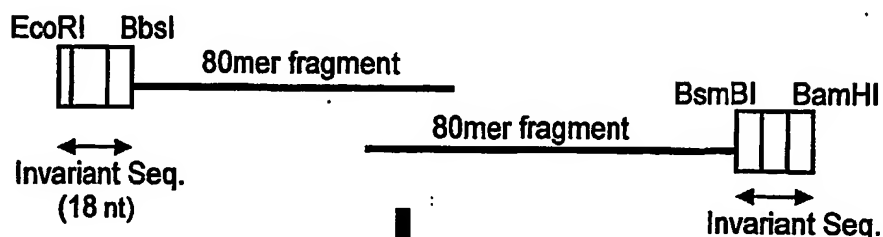
Invariant Seq.

Paired 80mer oligos are connected via PCR in a stepwise manner from 5' to 3' using
primers complimentary to the invariant seq.

80mer Fragment

5'primer   140bp PCR product   3'primer
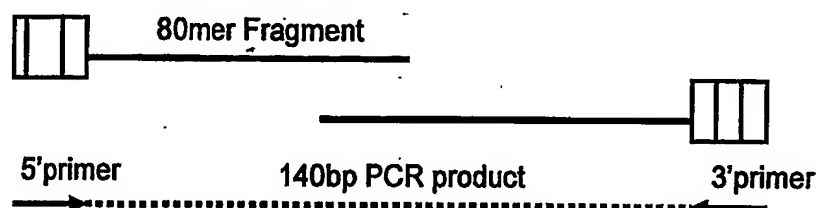
108bp PCR fragments cloned into pGEM-T and sequenced. Clones with the proper sequence
will be cut with 2 restriction enzymes. 4 fragments will be ligated together with pcDNA3.1 in
a stepwise manner from the 5' to 3' end of gene

Fragments to be ligated with pcDNA3.1 (1-4 are in order from 5' to 3')	Restriction Enzymes Used to Cleave Fragment
Fragment 1	EcoRI/BsmBI
Fragment 2	BbsI/BsmBI
Fragment 3	BbsI/BsmBI
Fragment 4	BbsI/BamHI
pcDNA3.1	EcoRI/BamHI

Fragment 2

Fragment 1

Fragment 3

EcoRI

Fragment 4

Gene
constructed
in pcDNA3.1

BamHI
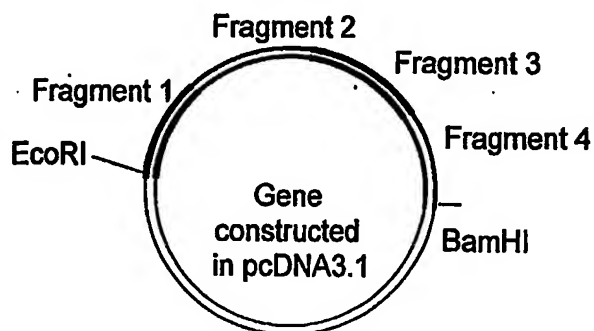
Ligations will be repeated stepwise 5' to 3' until the entire gene
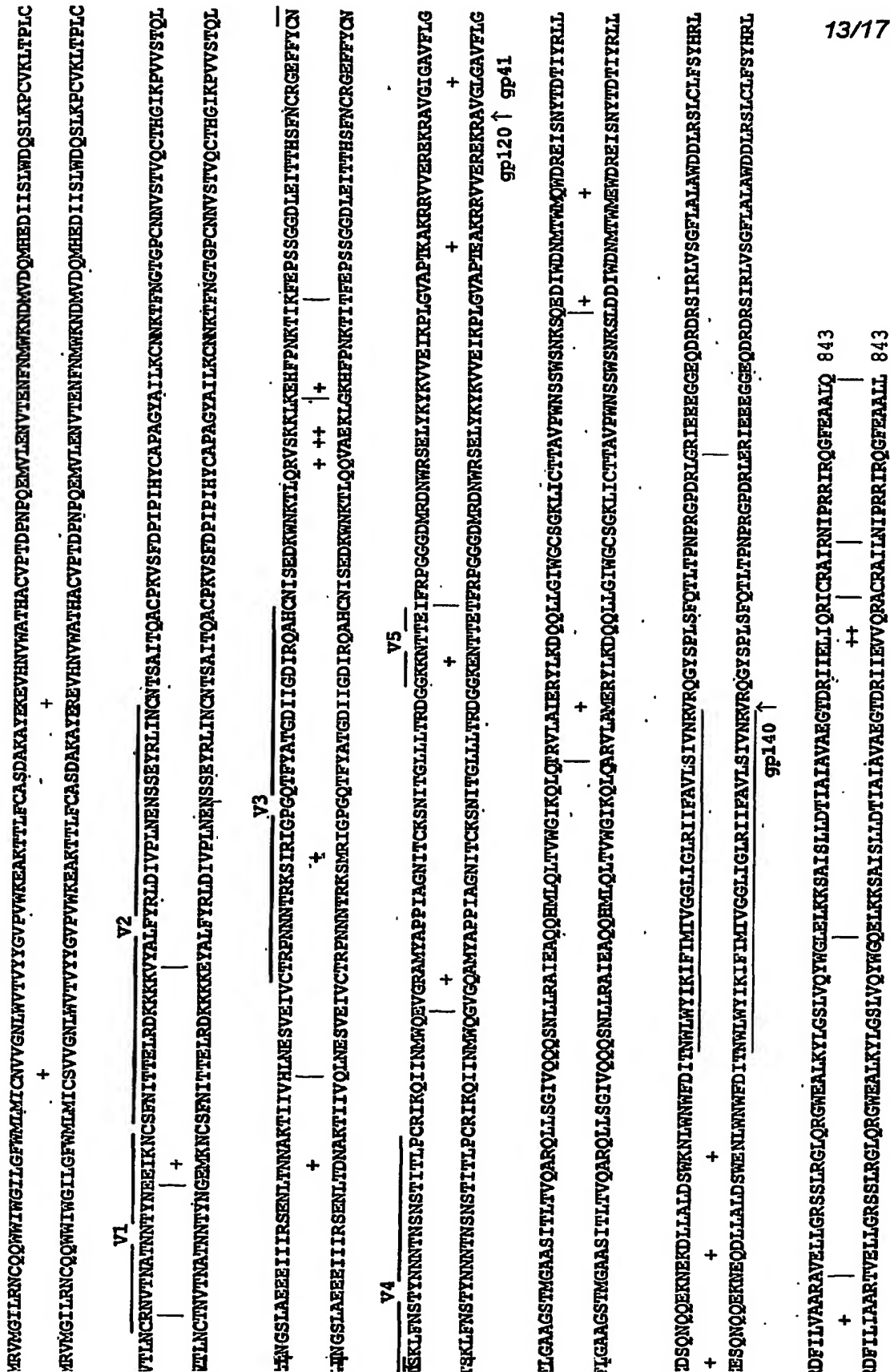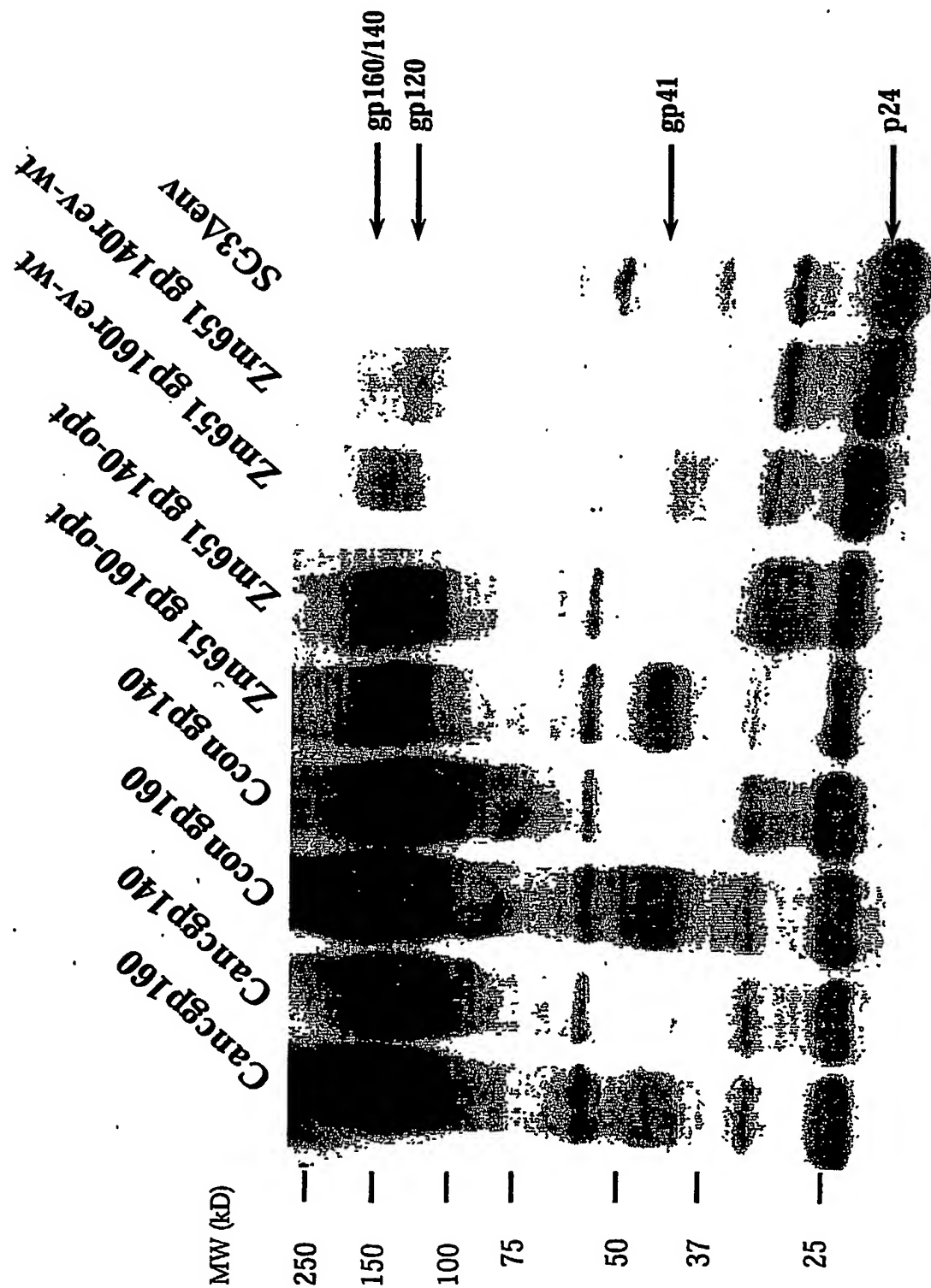has been cloned into pcDNA3.1
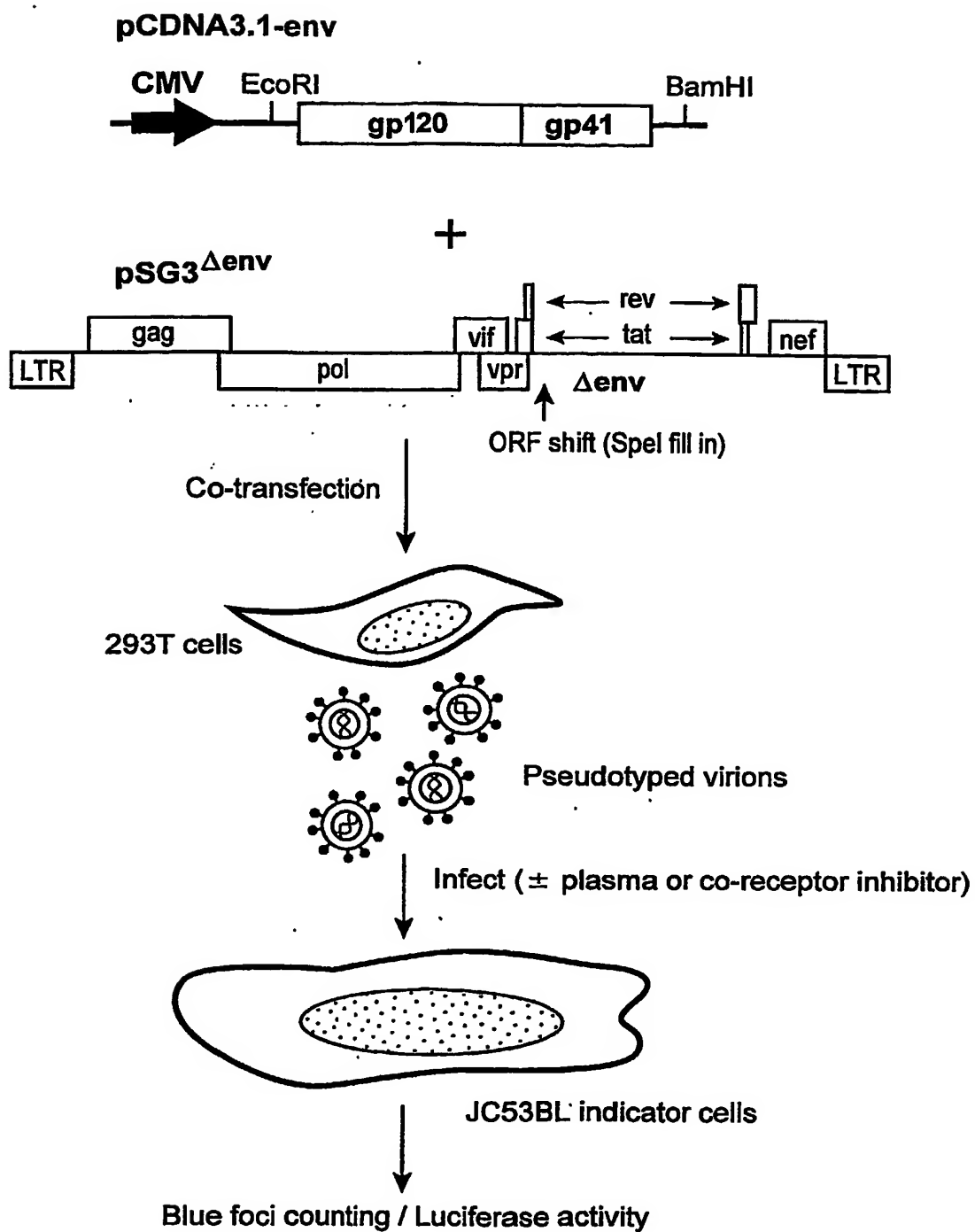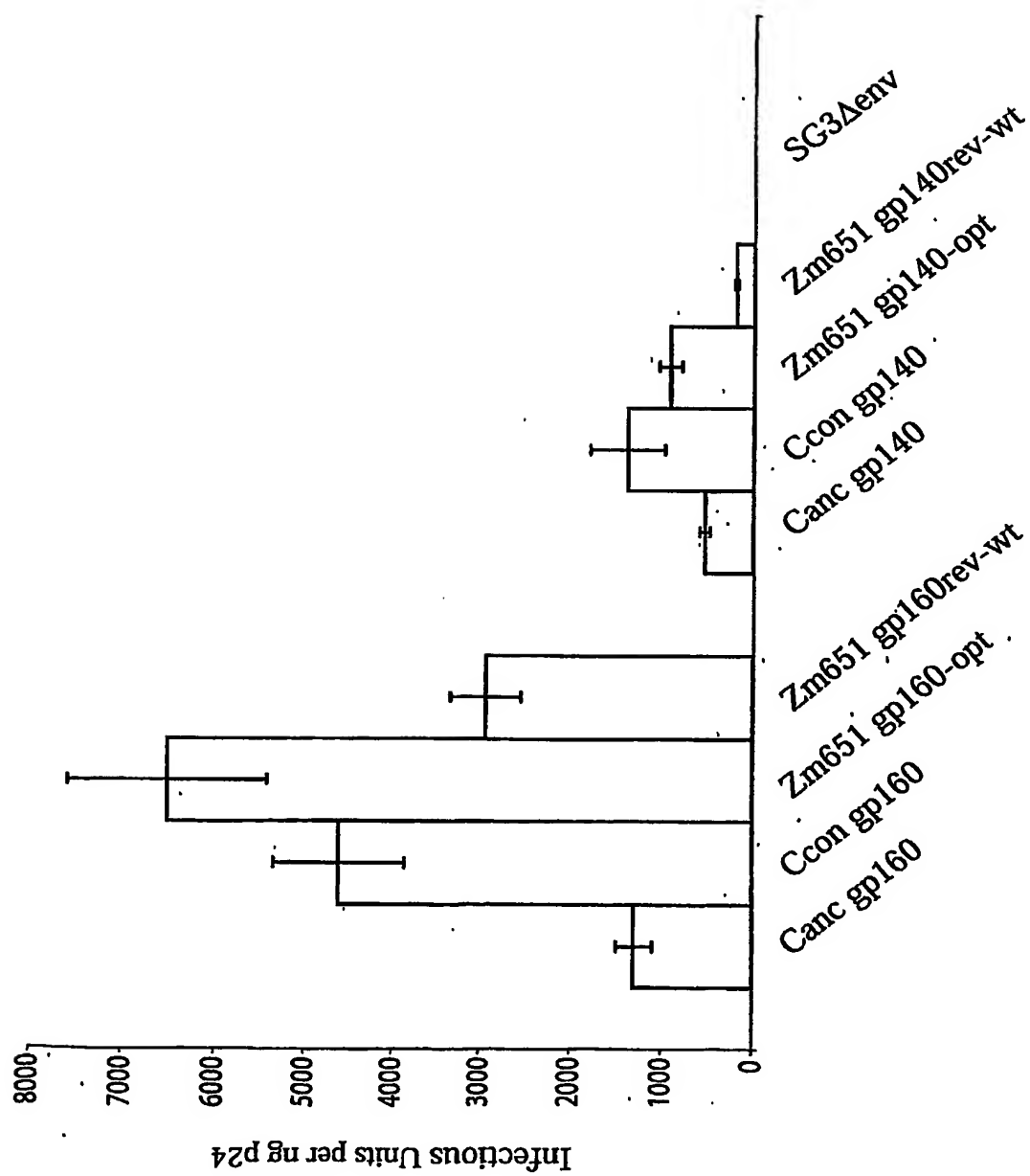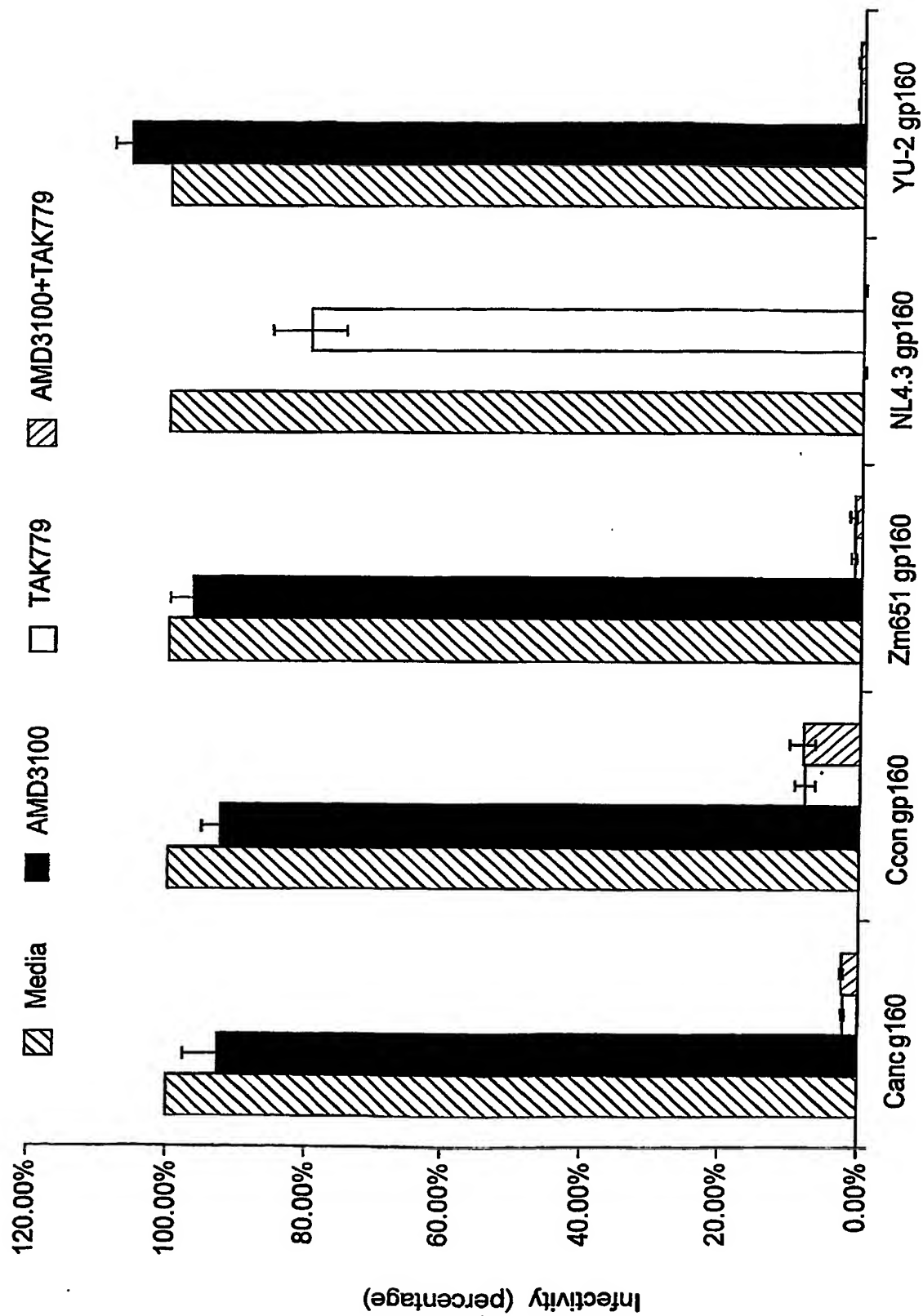
pCDNA3.1-env

CMV   EcoRI   BamHI

| gp120 | gp41 |

+

pSG3^Δenv

rev →

gag   vif   tat →

LTR   pol   vpr   Δenv   nef   LTR

ORF shift (Spel fill in)

Co-transfection

293T cells

Pseudotyped virions

Infect (± plasma or co-receptor inhibitor)

JC53BL indicator cells

Blue foci counting / Luciferase activity

Fig. 7

Fig. 8

Fig. 8

Fig. 9

Fig. 10A

Fig. 10B

Fig. 11

Fig. 12A

Fig. 12B
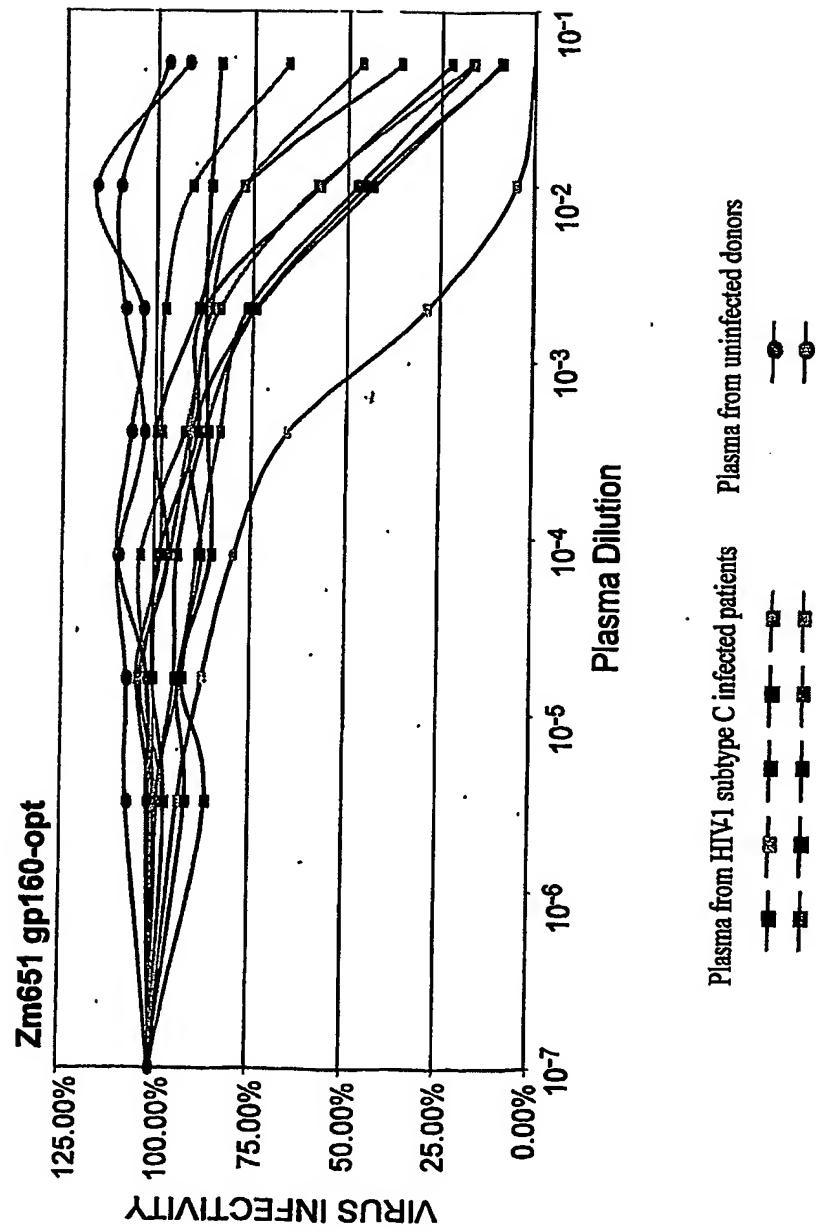
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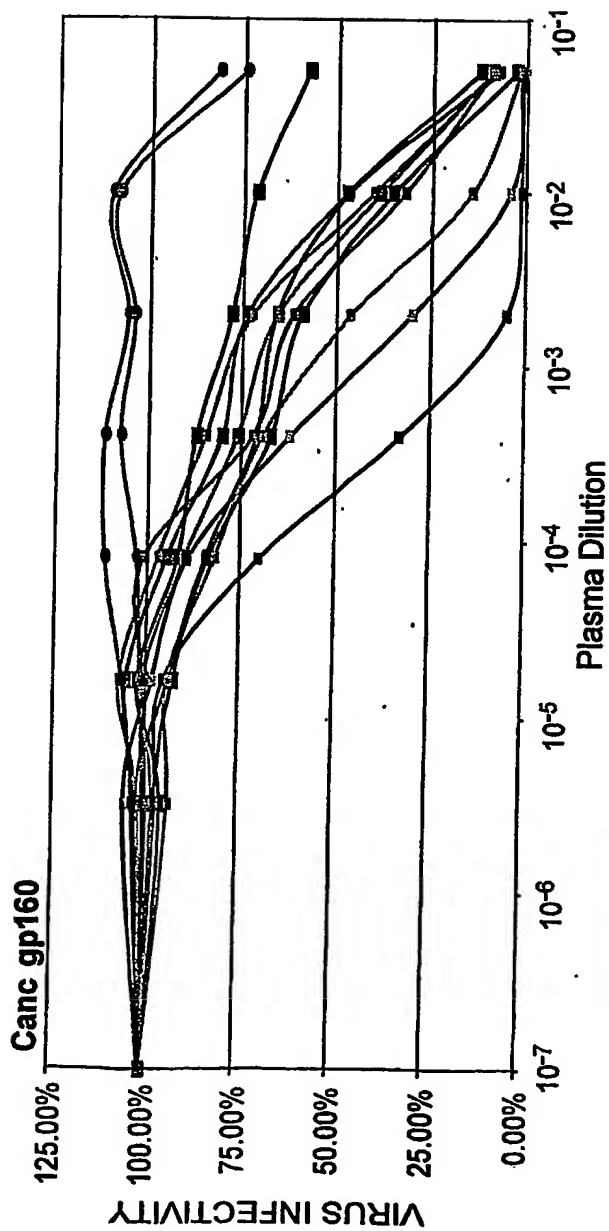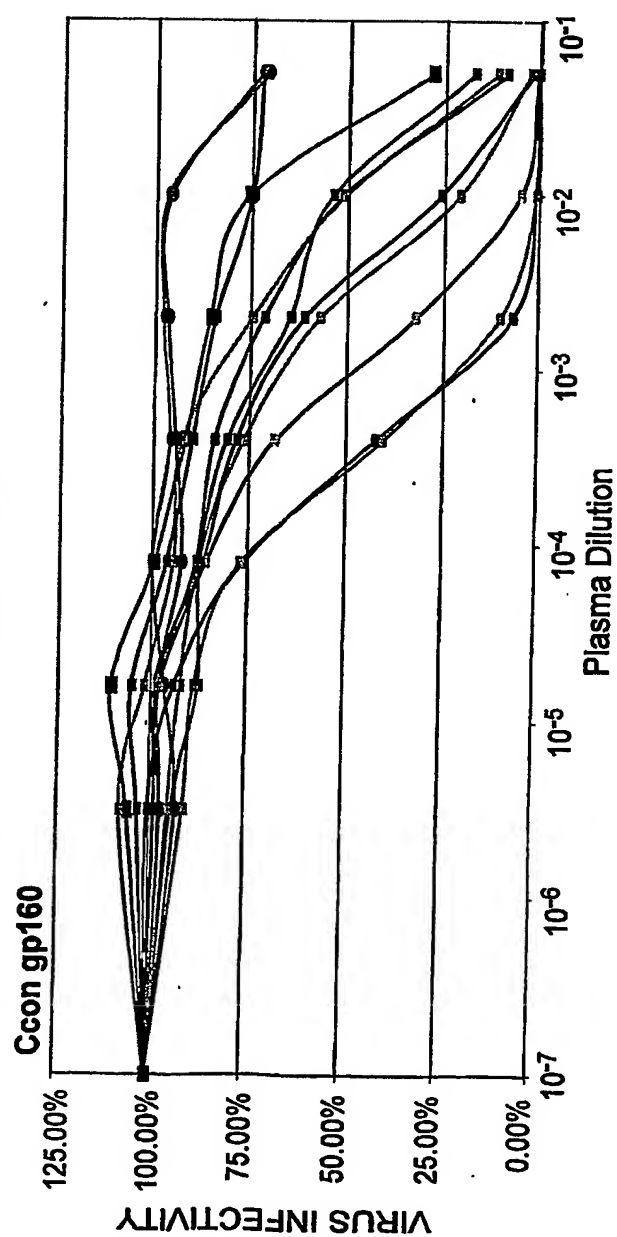
Fig. 12C

Fig. 13A

Fig. 13B

Gag

Nef

C.con.gag (subtype C con sensus gag)

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C.con.nef (subtype C consensus nef)

MGGKWSKSSIVGWPAVRERIRRTEPAAEGVGAASQDLDKYGALTSSNTATNNADCAWLEAQEEEEV
GFPVRPQVPLRPMTYKAAFDLSFFLKEKGGLEGLIYSKKRQEILDLWVYHTQGFFPDWQNYTPGPGVRYP
LTFGWCFKLVPVDPREVEEANEGENNCLLHPMSQHGMEDEDREVLKWKFDSHLARRHMARELHPEYYKDC

Fig. 13C

Fig. 13D

C.con.gag (subtype C consensus gag. Not in the public domain)

GCCGCCGCCATGGGCGCCGGCCGCCCAGCATCCTGCGGCGGGGCAAGCTGGACACCTGGGAGAAGATCCGCC
TGCGCCCCGGCGGGCAAGAAGCGCTACATGATCAAGCACCTGGTGTGGGCCAGCCGCGAGCTGGAGCGCTT
CGCCCTGAACCCCGGCCTGCTGGAGACCAGCGAGGGCTGCAAGCAGATCATGAAGCAGCTGCAGCCCGCC
CTGCAGACCGGCACCGAGGAGCTGCGCAGCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGA
AGATCGAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGAGCCAGCAGAA
GACCCAGCAGGCCGAGGCCGGCGCCGGCGCCGCAGCGGCAAGGTGAGCCAGAACTACCCCATCGTGCAGAACCTGCAG
GGCCAGATGGTGCACCAGGCCATCAGCCCCCGGAACGCCTGGGTGAAGGTGATCGAGGAGAAGG
CCTTCAGCCCCGAGGTGATCCCCATGTTCACCGCCCTGAGCGAGGGCGCCACCCCCAGGACCTGAACAC
CATGCTGAACACCGTGGGCGGCCACCAGGCCGCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCC
GCCGAGTGGGACCGCCTGCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGCG
GCAGCGACATCGCCGGCACCACCAGCACCCTGCAGGAGCAGATCGCCTGGATGACCAGCAACCCCCCGT
GCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACAGCCCC
GTGAGCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGA
CCCTGCGCGCGGAGCAGGCCACCCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGC
CAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGCGCCACCCTGGAGGAGATGATGACCGCC
TGCCAGGGCGTGGGCGGCCCGCGTGCTGGCCGAGGCCATGAGCCAGGCCAACAACA
CCAACATCATGATGCAGCGCGCAGCAACTTCAAGGGCCCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAA
GGAGGGCCACATCGCCCGCAACTGCCGCGGCCCCAGGCCCAGGCGCCAACTTCCTGGGCAAGATCTGGCCCAGCGCCAGAGGGGCC
CACCAGATGAAGGACTGCACCGAGCGCCAGGGAGAGCGCGCCCCCGAGCCCGGCCAACTTCCTGCTTCGAGGA
GACCACCCCCGCCCCCAAGCAGCAGAAGCGCCCAAGGAAGACCGGCCCTGACCAGCCCCTGAAGAGCCTGTTCGGC
AGCGACCCCCCTGAGCCAGTAA

Fig. 13E

C.con.nef (subtype C consensus nef. Not in the public domain)

GCCGCCGCCATGGGCGGCAAGTGGAGCAAGAGCAGCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCC
GCCGCACCGAGCCCGCCGCCGAGGGCGTGGGCGCCGCCAGCAGGCGACCTGGACAAGTACGGCGCCCTGAC
CAGCAGCAACACCGCCACCAACACGCCGACTGCCCCTGGCCTGGCCCCCATGACCTACAAAGCCGCCTTCGAC
GGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGCTGGCCTTCGACCTGAGCTTCT
TCCTGAAGGAGAAGGGCGGCCTGGAGGGCCTGATCTACAGCAAGAAGCGCCAGGAGATCCTGGACCTGTG
GGTGTACCACACCCAGGGCTTCTTCCCCGACTGGCAGAACTACACACCCGCCGGGCCGGCGTGCGCTACCCC
CTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGAGCCCGATGACCGGCCCATGACGGCGGGCGAAGTG
GAGAACAACTGCGACAGCCACCTGGCCCGCCCACCCCAGCCTGCGCCGGCAGCACTGCCGAGTGCTGAAGTG
GAAGTTCGACAGCAGCCTGGCCCGAGCTGCACCCCGAGTACTACAAGGACTGC
TGA

Fig. 13F

CONs.env (gorup M consensus env gene. This one contain the consensus sequence for variable regions in env gene)

MRVRGIQRNCQHLWRWGTLILGMLMICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNV
WATHACVPTDPNPQEIVLENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNVNVTN
TNNTEEKGEIKNCSFNITTEIRDKKQKVYALFYRLDVVPIDDNNNNSSNYRLINCNTSAITQACPKVSF
EPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIRSENITNN
AKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISGTKWNKTLQQVAKKLRE
HFNNKTIIFKPSSGGDLEITTHSFNCRGEFFYCNTSGLFNSTWIGNGTKNNNNTNDTITLPCRIKQIINM
WQGVGQAMYAPPIEGKITCKSNITGLLLTRDGGNNNTNETEIFRPGGGDMRDNWRSELYKYKVVKIEPLG
VAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHL
LQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTTVPWNSSWSNKSQDEIWDNMTWMEWEREI
NNYTDIIYSLIEESQNQQEKNEQELLALDKWASLWNWFDITNLWLWYIKIFIMIVGGLIGLRIVFAVLSIV
NRVRQGYSPLSFQTLIPNPRGPDRPEGIEEEGGEQDRDRSIRLVNGFLALAWDDLRSLCLFSYHRLRDFI
LIAARTVELLGRKGLRRGWEALKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRACRAIL
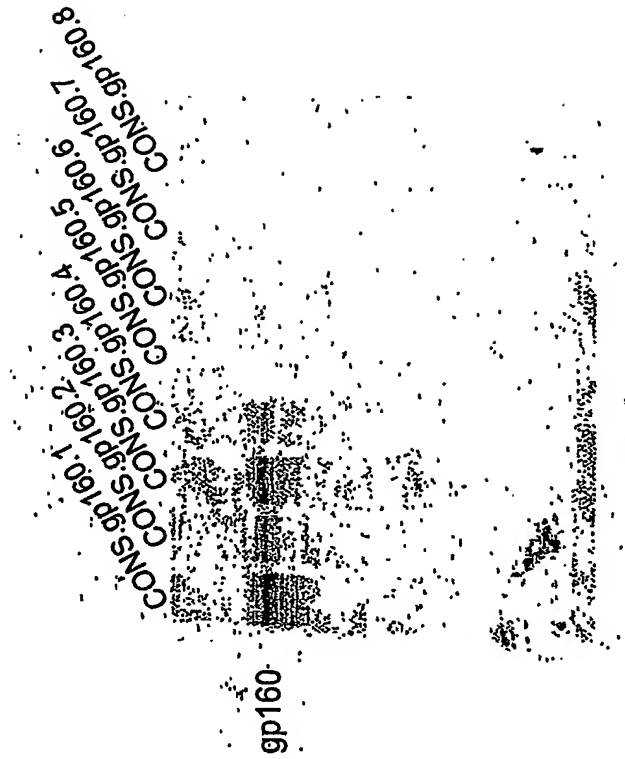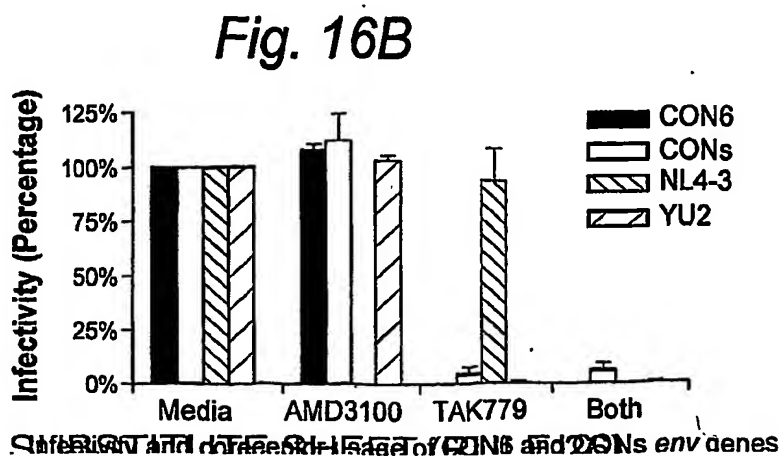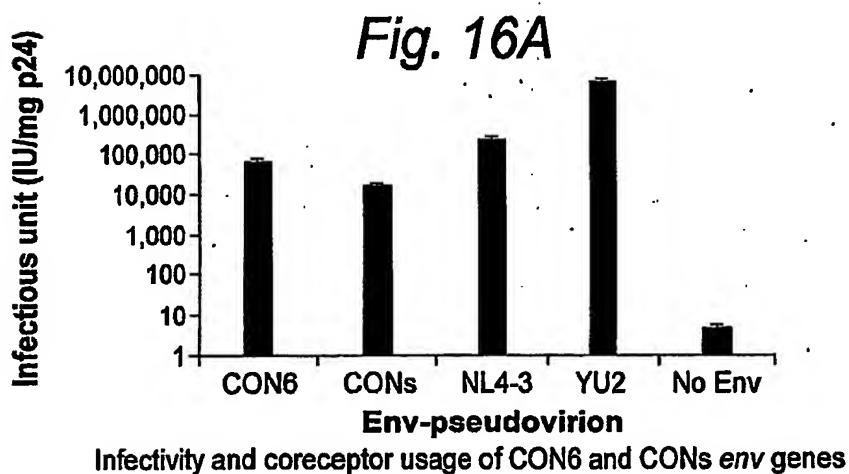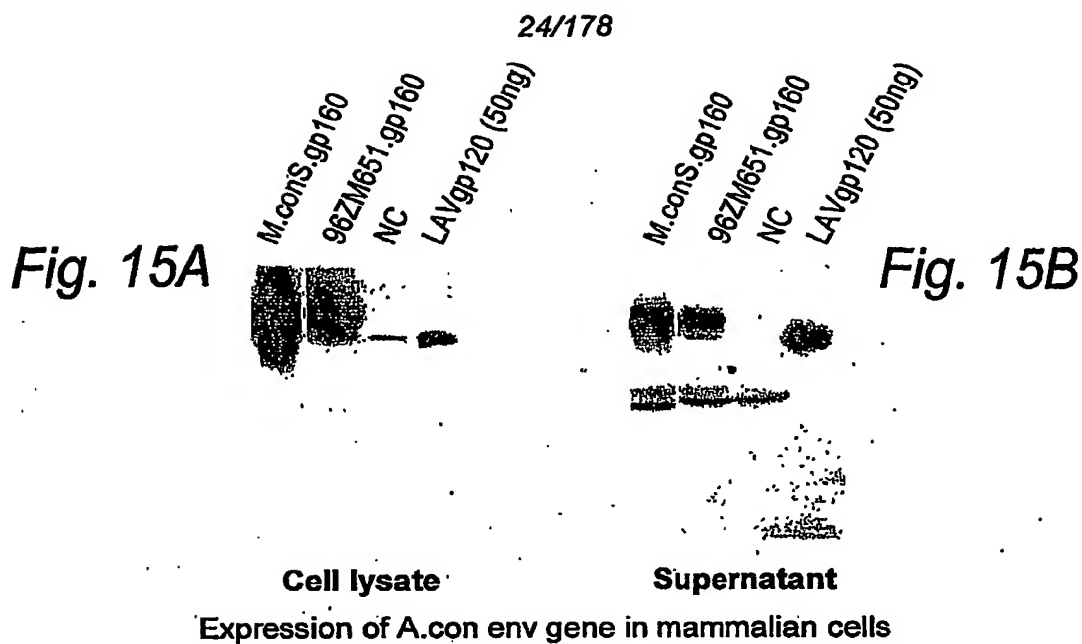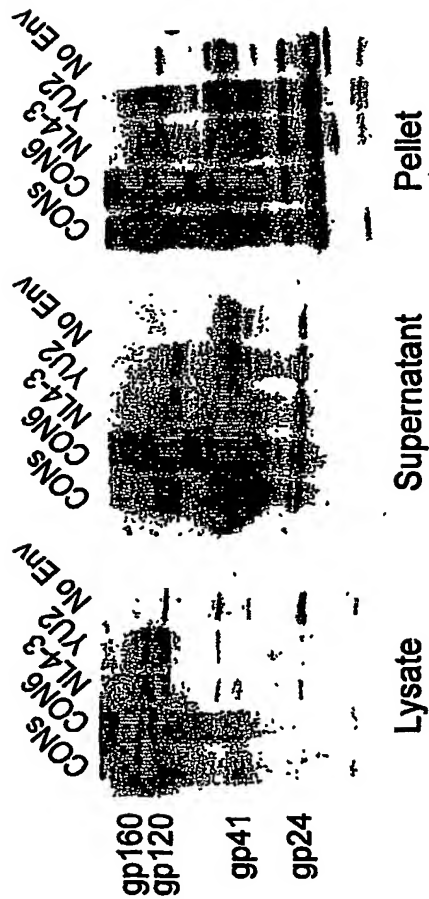NIPRRIRQGLERALL

Fig. 14A

Fig. 14C

Fig. 14B

CONs.env (gorup M consensus env gene. This one contain the
consensus sequence for variable regions in env gene. The identical
amino acid sequences as in the public domain)

```
GCCGCCGCCATGCGCGTGCGCGGCATCCAGCGCAACTGCCAGCACCTGTG
GCGCTGGGGCACCCTGATCCTGGGCATGCTGATGATCTGCTCCGCCGCCG
AGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCC
AACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCC
AGGAGATCGTGCTGGAGAACGTGACCGAGAACTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTC
CCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACTGCA
CCAACGTGAACGTGACCAACACCACCAACAACACCGAGGAGAAGGGCGAG
ATCAAGAACTGCTCCTTCAACATCACCACCGAGATCCGCGACAAGAAGCA
GAAGGTGTACGCCCTGTTCTACCGCCTGGACGTGGTGCCCATCGACGACA
ACAACAACAACTCCTCCAACTACCGCCTGATCAACTGCAACACCTCCGCC
ATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTA
CTGCGCCCCCGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCA
ACGGCACCGGCCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCACGGC
ATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGA
GGAGGAGATCATCATCCGCTCCGAGAACATCACCAACAACGCCAAGACCA
TCATCGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAAC
AACAACACCCGCAAGTCCATCCGCATCGGCCCCGGCCAGGCCTTCTACGC
CACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCG
GCACCAAGTGGAACAAGACCCTGCAGCAGGTGGCCAAGAAGCTGCGCGAG
CACTTCAACAACAAGACCATCATCTTCAAGCCCTCCTCCGGCGGCGACCT
GGAGATCACCACCCACTCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCA
ACACCTCCGGCCTGTTCAACTCCACCTGGATCGGCAACGGCACCAAGAAC
AACAACAACACCAACGACACCATCACCCTGCCCTGCCGCATCAAGCAGAT
CATCAACATGTGGCAGGGCGTGGGCCAGGCCATGTACGCCCCCCCCATCG
AGGGCAAGATCACCTGCAAGTCCAACATCACCGGCCTGCTGCTGACCCGC
GACGGCGGCAACAACAACACCAACGAGACCGAGATCTTCCGCCCCGGCGG
CGGCGACATGCGCGACAACTGGCGCTCCGAGCTGTACAAGTACAAGGTGG
TGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGCCGCGTG
GTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCTGGGCTT
CCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATCACCCTGACCG
TGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGTCCAACCTG
CTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGCAGCTGACCGTGTGGGG
CATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACCTGAAGG
ACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTGCACC
ACCACCGTGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCAGGACGAGAT
CTGGACAACATGACCTGGATGGAGTGGGAGCGCGAGATCAACAACTACA
CCGACATCATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAG
AACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAACTG
GTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCG
TGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTG
AACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCTGATCCC
CAACCCCCGCGGCCCCGACCGCCCCGAGGGCATCGAGGAGGAGGGCGGCG
AGCAGGACCGCGACCGCTCCATCCGCCTGGTGAACGGCTTCCTGGCCCTG
GCCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCGCCTGCG
CGACTTCATCCTGATCGCCGCCCGCACCGTGGAGCTGCTGGGCCGCAAGG
GCCTGCGCCGCGGCTGGGAGGCCCTGAAGTACCTGTGGAACCTGCTGCAG
TACTGGGGCCAGGAGCTGAAGAACTCCGCCATCTCCCTGCTGGACACCAC
CGCCATCGCCGTGGCCGAGGGCACCGACCGCGTGATCGAGGTGGTGCAGC
GCGCCTGCCGCGCCATCCTGAACATCCCCCGCCGCATCCGCCAGGGCCTG
GAGCGCGCCCTGCTCTGATAA
```

Fig. 15A   Fig. 15B

Cell lysate   Supernatant

Expression of A.con env gene in mammalian cells

Fig. 16A

Infectivity and coreceptor usage of CON6 and CONs *env* genes

Fig. 16B

Infectivity and coreceptor usage of CON6 and CONs *env* genes

Env protein incorporation in CON6 and CONs Env-pseudovirions
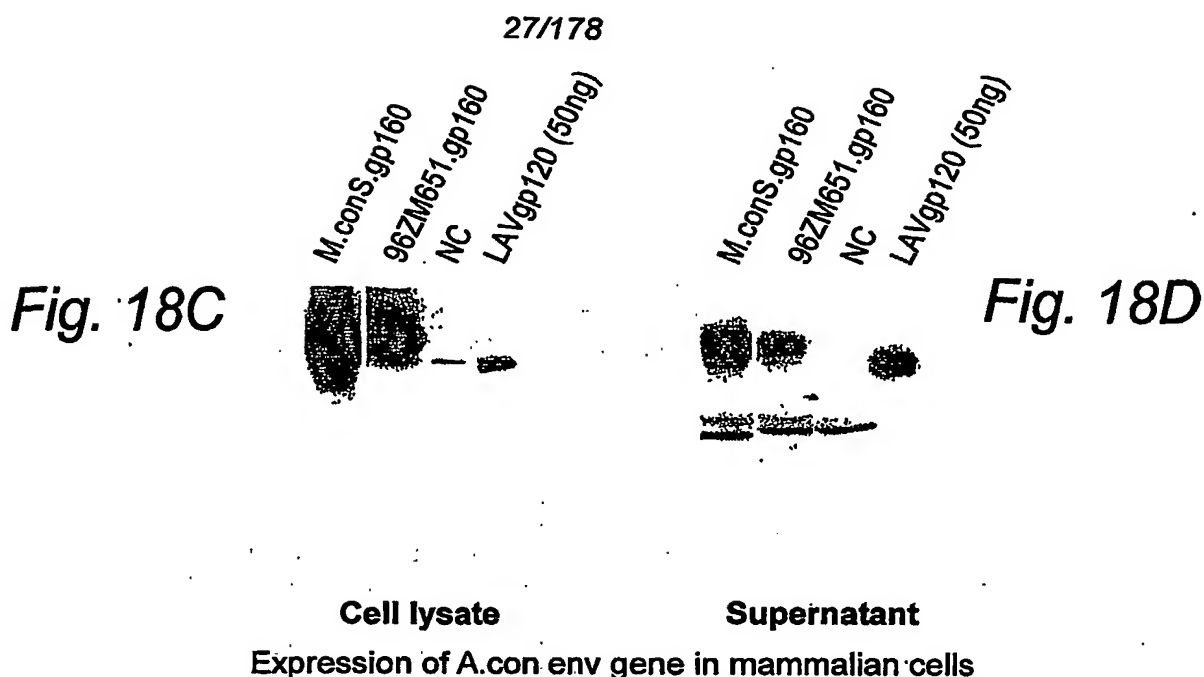
Fig. 17A   *Fig. 17B*   *Fig. 17C*

A.con.env (subtype A consensus env)
MRVMGIQRNCQHLWRWGTMILGMIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYDTEVHNV
WATHACVPTDPNPQEINLENVTEEFNMWKNNMVEQMHTDIISLMDQSLKPCVKLTPLCVTLNCSNVNVTT
NITNITDNMKGEIKNCSFNMTTELRDKKQKVYSLFYKLDVVQINKSNSSSQYRLINCNTSAITQACPKVS
FEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVMIRSENITN
NAKNIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTEWNETLQKVAKQLR
KYFNNKTIIFTNSSGGDLEITTHSFNCGGEFFYCNTSGLFNSTWNGNGTKKKNSTESNDTITLPC RIKQI
INMWQRVGQAMYAPPIQGVIRCESNITGLLLTRDGGDNNSKNETFRPGGGDMRDNWRSELYKYKVVKIEP
LGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQSNLLRAIEAQQ
HLLKLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQSEIWDNMTWLQWDK
EISNYTDIIYNLIEESQNQEKNEQDLLALDKWANLW NWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLS
VINRVRQGYSPLSFQTHTPNPGGLDRPGRIEEEGEQGRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRD
FILIAARTVELLGHSSLKGLRLGWEGLKYLWNLLLYWGRELKISAINLLDTIAIAVAGWTDRVIEIGQRI
CRAILNIPRRIRQGLERALL

Fig. 18A

Fig. 18B

A.con.env (subtype A consensus env. Identical amino acid
sequence to that in the public domain)

```
GCCGCCGCCATGCGCGTGATGGGCATCCAGCGCAACTGCCAGCACCTGTG
GCGCTGGGGCACCATGATCCTGGGCATGATCATCATCTGCTCCGCCGCCG
AGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGACGCC
GAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCC
AGGAGATCAACCTGGAGAACGTGACCGAGGAGTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACACCGACATCATCTCCCTGTGGGACCAGTC
CCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACTGCT
CCAACGTGAACGTGACCACCAACATCACCAACATCACCGACAACATGAAG
GGCGAGATCAAGAACTGCTCCTTCAACATGACCACCGAGCTGCGCGACAA
GAAGCAGAAGGTGTACTCCCTGTTCTACAAGCTGGACGTGGTGCAGATCA
ACAAGTCCAACTCCTCCTCCCAGTACCGCCTGATCAACTGCAACACCTCC
GCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCA
CTACTGCGCCCCCGCCGGCTTCGCCATCCTGAAGTGCAAGGACAAGGAGT
TCAACGGCACCGGCCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCAC
GGCATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGC
CGAGGAGGAGGTGATGATCCGCTCCGAGAACATCACCAACAACGCCAAGA
ACATCATCGTGCAGCTGACCAAGCCCGTGAAGATCAACTGCACCCGCCCC
AACAACAACACCCGCAAGTCCATCCGCATCGGCCCCGGCCAGGCCTTCTA
CGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACGTGT
CCCGCACCGAGTGGAACGAGACCCTGCAGAAGGTGGCCAAGCAGCTGCGC
AAGTACTTCAACAACAAGACCATCATCTTCACCAACTCCTCCGGCGGCGA
CCTGGAGATCACCACCCACTCCTTCAACTGCGGCGGCGAGTTCTTCTACT
GCAACACCTCCGGCCTGTTCAACTCCACCTGGAACGGCAACGGCACCAAG
AAGAAGAACTCCACCGAGTCCAACGACACCATCACCCTGCCCTGCCGCAT
CAAGCAGATCATCAACATGTGGCAGCGCGTGGGCCAGGCCATGTACGCCC
CCCCCATCCAGGGCGTGATCCGCTGCGAGTCCAACATCACCGGCCTGCTG
CTGACCCGCGACGGCGGCGACAACAACTCCAAGAACGAGACCTTCCGCCC
CGGCGGCGGCGACATGCGCGACAACTGGCGCTCCGAGCTGTACAAGTACA
AGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGC
CGCGTGGTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCT
GGGCTTCCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATCACCC
TGACCGTGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGTCC
AACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGAAGCTGACCGT
GTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACC
TGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATC
TGCACCACCAACGTGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCAGTC
CGAGATCTGGGACAACATGACCTGGCTGCAGTGGGACAAGGAGATCTCCA
ACTACACCGACATCATCTACAACCTGATCGAGGAGTCCCAGAACCAGCAG
GAGAAGAACGAGCAGGACCTGCTGGCCCTGGACAAGTGGGCCAACCTGTG
GAACTGGTTCGACATCTCCAACTGGCTGTGGTACATCAAGATCTTCATCA
TGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCC
GTGATCAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCA
CACCCCCAACCCCGGCGGCCTGGACCGCCCCGGCCGCATCGAGGAGGAGG
GCGGCGAGCAGGGCCGCGACCGCTCCATCCGCCTGGTGTCCGGCTTCCTG
GCCCTGGCCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCG
CCTGCGCGACTTCATCCTGATCGCCGCCCGCACCGTGGAGCTGCTGGGCC
ACTCCTCCCTGAAGGGCCTGCGCCTGGGCTGGGAGGGCCTGAAGTACCTG
TGGAACCTGCTGCTGTACTGGGGCCGCGAGCTGAAGATCTCCGCCATCAA
CCTGCTGGACACCATCGCCATCGCCGTGGCCGGCTGGACCGACCGCGTGA
TCGAGATCGGCCAGCGCATCTGCCGCGCCATCCTGAACATCCCCCGCCGC
ATCCGCCAGGGCCTGGAGCGCGCGCTGCTGTAATAA F 26)
```

Fig. 18C

M.conS.gp160
96ZM651.gp160
NC
LAVgp120 (50ng)

Fig. 18D

M.conS.gp160
96ZM651.gp160
NC
LAVgp120 (50ng)

Cell lysate   **Supernatant**

Expression of A.con env gene in mammalian cells

Fig. 19A

M.con.gag (group M consensus gag. Identical amino acid sequence to that in the public domain)

GCCGCCGCCATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGA
CGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCC
TGAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAAC·
CCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCGGCCAGCT·
GCAGCCCGCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACA
CCGTGGCCACCCTGTACTGCGTGCACCAGCGCATCGAGGTGAAGGACACC ,·
AAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAA '
GACCCAGCAGGCCGCCGCCGACAAGGGCAACTCCTCCAAGGTGTCCCAGA
ACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATC
TCCCCCCGCACCCTGAACGCCTGGGTGAAGGTGATCGAGGAGAAGGCCTT
CTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCC
CCCAGGACCTGAACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCC
ATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCG·
CCTGCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGC
CCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATC
GCCTGGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCG
CTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCGTGT
CCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTG
GACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCACCCAGGACGTGAA
GAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCA
AGACCATCCTGAAGGCCCTGGGCCCCGGCGCCACCCTGGAGGAGATGATG
ACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGC
CGAGGCCATGTCCCAGGTGACCAACGCCGCCATCATGATGCAGCGCGGCA
ACTTCAAGGGCCAGCGCCGCATCATCAAGTGCTTCAACTGCGGCAAGGAG
GGCCACATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAA
GTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTC
CTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGCCGAGTCCTTCGGCTT
CGGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCCCAAGGACAAGGAGC
CCCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGACCCCCTGTCCCAG
TGA

SUBSTITUTE SHEET (RULE 26)

M.con.pol.nuc   28/178

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GCCGCCGCCATGCCCCAGATCACCCTGTGGCAGCGCCCCCTGGTGACCAT
CAAGATCGGCGGCCAGCTGAAGGAGGCCCTGCTGGCCACCGGCGCCGACG
ACACCGTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCT
GATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCCCA
CCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGATCGGCTGCACC
CTGAACTTCCCCATCTCCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCC
CGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGA
TCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCCATCTTCGCCATCAA
GAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGA
ACAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCC
GCCGGCCTGAAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGC
CTACTTCTCCGTGCCCCTGGACGAGGACTTCCGCAAGTACACCGCCTTCA
CCATCCCCTCCATCAACAACGAGACCCCCGGCATCCGCTACCAGTACAAC
GTGCTGCCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCAT
GACCAAGATCCTGGAGCCCTTCCGCACCCAGAACCCCGAGATCGTGATCT
ACCAGTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAG
CACCGCGCCAAGATCGAGGAGCTGCGCGAGCACCTGCTGCGCTGGGGCTT
CACCACCCCCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGG
GCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCC
GAGAAGGACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCT
GAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGAAGCAGCTGTGCA
AGCTGCTGCGCGGCGCCAAGGCCCTGACCGACATCGTGCCCCTGACCGAG
GAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGT
GCACGGCGTGTACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGA
AGCAGGGCCAGGACCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAG
AACCTCAAGACCGGCAAGTACGCCAAGATGCGCTCCGCCCACACCAACGA
CGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCACCGAGTCCATCG
TGATCTGGGGCAAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACC
```

```
TGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATTCCCGAGTG
GGAGTTCGTGAACACCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGA
AGGAGCCCATCGCCGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAAC
CGCGAGACCAAGCTGGGCAAGGCCGGCTACGTGACCGACGCGGCCGCCA.
GAAGGTGGTGTCCCTGACCGAGACCACCAACCAGAAAACCGAGCTGCAGG
CCATCCACCTGGCCCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACC
GACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACAAGTCCGA
GTCCGAGCTGGTGAACCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGG
TGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAG
GTGGACAAGCTGGTGTCCACCGGCATCCGCAAGGTGCTGTTCCTGGACGG
CATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCG
CCATGGCCTCCGACTTCAACCTGCCCCCCATCGTGGCCAAGGAGATCGTG
GCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGT
GGACTGCTCCCCCGGCATCTGGCAGCTGGACTGCACCCACCTGGAGGGCA
AGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGCCGAG
GTGATCCCCGCCGAGACCGGCCAGGAGACCGCCTACTTCATCCTGAAGCT
GGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACT
TCACCTCCGCCGCCGTGAAGGCCGCCTGCTGGTGGCCGGCATCCAGCAG
GAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCAT
GAACAAGGAGCTGAAGAAGATCATCGGCCAGGTGCGCGACCAGGCCGAGC
ACCTCAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGC
AAGGGCGGCATCGGCGGCTACTCCGCCGGCGAGCGCATCATCGACATCAT
CGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCC
AGAACTTCCGCGTGTACTACCGCGACTCCCGCGACCCCATCTGGAAGGGC
CCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAA
CTCCGACATCAAGGTGGTGCCCCGCCGCAAGGCCAAGATCATCCGCGACT·
ACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCGGCCGCCAGGACGAG
GACTAA
```

Fig. 19B

Fig. 19C

M.con.nef (group M consensus nef. Identical amino acid sequence
to that in the public domain)

GCCGCCGCCATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCC
CGCCGTGCGCGAGCGCATCCGCCGCACCCACCCCGCCGCCGAGGGCGTGG
GCGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAAC
ACCGCCGCCAACAACCCCGACTGCGCCTGGCTGGAGGCCCAGGAGGAGGA
GGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGA
CCTACAAGGCCGCCCTGGACCTGTCCCACTTCCTGAAGGAGAAGGGCGGC
CTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTG
GGTGTACCACACCCAGGGCTACTTCCCCGACTGGCAGAACTACACCCCCG
GCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTG
CCCGTGGACCCCGAGGAGGTGGAGGAGGCCAACGAGGGCGAGAACAACTC
CCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACGAGGAGCGCGAGG
TGCTGATGTGGAAGTTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGC
GAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 19D

C.con.pol.nuc

GCCGCCGCCATGCCCCAGATCACCCTGTGGCAGCGCCCCCTGGTGTCCAT
CAAGGTGGGCGGCCAGATCAAGGAGGCCCTGCTGGCCACCGGCGCCGACG
ACACCGTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCT
GATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCCCA
CCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGCTGGGCTGCACC
CTGAACTTCCCCATCTCCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCC
CGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGA
TCAAGGCCCTGACCGCCATCTGCGAGGAGATGGAGAAGGAGGGCAAGATC
ACCAAGATCGGCCCCGAGAACCCCTACAACACCCCCGTGTTCGCCATCAA
GAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGA
ACAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCC
GCCGGCCTGAAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGC
CTACTTCTCCGTGCCCCTGGACGAGGGCTTCCGCAAGTACACCGCCTTCA
CCATCCCCTCCATCAACAACGAGACCCCCGGCATCCGCTACCAGTACAAC
GTGCTGCCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCAT
GACCAAGATCCTGGAGCCCTTCCGCGCCCAGAACCCCGAGATCGTGATCT
ACCAGTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAG
CACCGCGCCAAGATCGAGGAGCTGCGCGAGCACCTGCTGAAGTGGGGCTT
CACCACCCCCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGG
GCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCC
GAGAAGGACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCT
GAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGCGCCAGCTGTGCA
AGCTGCTGCGCGGCGCCAAGGCCCTGACCGACATCGTGCCCCTGACCGAG
GAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGT
GCACGGCGTGTACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGA
AGCAGGGCCACGACCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAG
AACCTCAAGACCGGCAAGTACGCCAAGATGCGCACCGCCCACACCAACGA
CGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCATGGAGTCCATCG
TGATCTGGGGCAAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACC
TGGGAGACCTGGTGGACCGACTACTGGCAGGCCACCTGGATTCCCGAGTG
GGAGTTCGTGAACACCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGA
AGGAGCCGATTGAGGGGGTGGAGATTCTTATGTCGACGGCGCCGCCAAC

CGCGGAGACCAAGAGATCGGCAAGGCCGGCTACGTGACCGACACCGCGCGGCCGCCA
GAAGATCGTGTCCCTGACCGAGACCACCACCAGAAAACCGAGCTGCAGG
CCATCCAGCTGCCCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACC
GACTCCCAGTACGCGCCCTGGCATCATCGAGCAGCAGTCGACAAGTCCGA
GTCCGAGCTGGTGAACCAGATCATCGAGCAGGGCATCGGCGCAACGAGCGCG
TGTACCTGTCCTGGGTGCCCGCCACAAGGGCATCGGCGCAACGAGCAG
GTGGACAAGCTGGTGTCCTCCGGGCATCCGCAAGGTGCTGTTCCTGGACGG
CATGAACAAGGCCCAGAGAGGAGCACGAGAAGTACCACTCCAACTGCGCGCG
CCAÍGGCCTCCGAGTTCAACCTGCCCCATCGTGGCCAAGGAGATCGTG
GCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGT
GGACTGCTCCCCCGGCATCTGGCAGCTGGACTGCCTCCGGCTACATCGAGGGCCGAG
AGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGGCCGAG
GTGATCCCCGCCGAGACCGGCCAGGAGACCGCCTACTTCATCCTGAAGCT
GGCCGGCCGCTGGCCGTGAAGGTGATCGATCCCGCCGACAAGGCTCCAACT
TCACCTCCGCCGTGAAGGCCGTGCTGTGGCCGCGCATCCAGCAG
GAGTTCGGCATCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCAT
GAACAAGGAGCTGAAGAAGATCATCGGCCAGGTGCGACCAGGCCGAGC
ACCTCAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGC
AAGGGCGGCATCGGCGGCTACTCCGGCGAGGCCATCGAGATCATCAAGATCAT
CGCCACCAGCATCCAGACCAAGAGAGCTGCAGAAGCAGATCAGAGATCC
AGAACTTCGGCGTGTACTACGGCCACTCCCGCGACTCCGGTGGATGGGC
CCCGCCAAGCTGCTGTGGAAGGGCGAGGGGCCCGCCAAGGCCAGAGACAA
CTCCGACATCAAGGTGGTGCCCCGCCAAGGCCAAGATCATCAAGGACT
ACGGCAAGCAGCAGATGGCCGGCGCCGACTGCTGCCGGCCGCCCAGGAGCGAG
GACTAA

M.con.gag (group M consensus gag)
MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEG CKQIIGQLQPA
LQTGSEELRSLYNTVATLYCVHQRIEVKDTKEALEKIEEEQNKSQQKTQAAADKGNSSKVSQNYPIVQN
LQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKDTINE
EAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGEIYKRWIILGLNKIVRMY
SPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMM
TACQGVGGPGHKARVLAEAMSQVTNAAIMMQRGNFKGQRRIIKCFNCGKEGHIARNCRAPRKKGCWKCGK
EGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAESFGFGEEITPSPKQEPKDKEPPLTSLK
SLFGNDPLSQ

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Fig. 19F

M.con.pol (group M consensus pol)
MPQITLWQRPLVTIKIGGQLKEALLaTGADDTVLEEINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGK
KAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALTEICTE
MEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLD
VGDAYFSVPLDEDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTQNPEIVI
YQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKD
SWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAENREILKEPVHGVYYD
PSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIATESIVIWGKTPKFR
LPIQKETWETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKLGKAGYVTD
RGRQKVVSLTETTNQKTELQAIHLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEK
VYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGIDKAQEEHEKYHSNWRAMASDFNLPPIVAKEIVASC
DKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPV
KVIHTDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAV
FIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQKQIIKVPRRKAKIIRDYGKQMAGDDCVAGRQDED
IQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED

Fig. 19G

M.con.nef (group M consensus nef)
MGGKWSKSSIVGWPAVRERIRRTHPAABGVGAVSQDLDKHGAITSSNTAANNPDCAWLEAQEEEEVGFP
VRPQVPLRPMTYKAALDLSHFLKERGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTF
GWCFKLVPVDPEEVEEANEGENNSLLHPMCQHGMEDEEREVLMWKFDSRLALRHIARELHPEYYKDC

Fig. 19H

C.con.pol (subtype C consensus pol)
MPQITLWQRPLVSIKVGGQIKEALLaTGADDTVLEEINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGK
KAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALTAICEE
MEKEGKITKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLD
VGDAYFSVPLDEGFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAQNPEIVI
YQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKD
SWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAENREILKEPVHGVYYD
PSKDLIAEIQKQGHDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVIWGKTPKFR
LPIQKETWETWWTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKIGKAGYVTD
RGRQKIVSLTETTNQKTELQAIQLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKER
VYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMASEFNLPPIVAKEVVASC
DKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPV
KVIHTDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAV
FIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQKQIIKDYGKQMAGADCVAGRQDED
IQDNSDIKVVPRRKAKIIKDYGKQMAGADCVAGRQDED

Fig. 20A

B.con.gag (subtype B consensus gag. The amino acid sequence is different from Los Alamos Database August 2002)

```
GCCGCCGCCATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCGAGCTGGA
CCGCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACAAGC
TGAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAAC
CCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGGGCCAGCT
GCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACA
CCGTGGCCACCCTGTACTGCGTGCACCAGCGCATCGAGGTGAAGGACACC
AAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAA
GGCCCAGCAGGCCGCCGCCGACACCGGCAACTCCTCCCAGGTGTCCCAGA
ACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATC
TCCCCCCGCACCCTGAACGCCTGGGTGAAGGTGGTGGAGGAGAAGGCCTT
CTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCC
CCCAGGACCTGAACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCC
ATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCG
CCTGCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGC
CCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATC
GGCTGGATGACCAACAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCG
CTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCACCT
CCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTG
GACCGCTTCTACAAGACCCTGCGCGCCGAGCAGGCCTCCCAGGAGGTGAA
GAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCA
AGACCATCCTGAAGGCCCTGGGCCCCGCCGCCACCCTGGAGGAGATGATG
ACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGC
CGAGGCCATGTCCCAGGTGACCAACTCCGCCACCATCATGATGCAGCGCG
GCAACTTCCGCAACCAGCGCAAGACCGTGAAGTGCTTCAACTGCGGCAAG
GAGGGCCACATCGCCAAGAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTG
GAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAAC
TTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGAGGAGTCCTTCCG
CTTCGGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACA
AGGAGCTGTACCCCCTGGCCTCCCTGCGCTCCCTGTTCGGCAACGACCCC
TCCTCCCAGTAA
```

Fig. 20B

B.con.env (subtype B consensus env. The amino acid sequence is different from Los Alamos Database August 2002)

```
GCCGCCGCCATGCGCGTGAAGGGCATCCGCAAGAACTACCAGCACCTGTG
GCGCTGGGGCACCATGCTGCTGGGCATGCTGATGATCTGCTCCGCCGCCG
AGAAGCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCC
ACCACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCC
AGGAGGTGGTGCTGGAGAACGTGACCGAGAACTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTC
CCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACTGCA
CCGACCTGAAGAACAACCTGCTGAACACCAACTCCTCCTCCGGCGAGAAG
ATGGAGAAGGGCGAGATCAAGAACTGCTCCTTCAACATCACCACCTCCAT
CCGCGACAAGGTGCAGAAGGAGTACGCCCTGTTCTACAAGCTGGACGTGG
TGCCCATCGACAACAACAACAACACCTCCTACCGCCTGATCTCCTGCAAC
ACCTCCGTGATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCC
CATCCACTACTGCGCCCCCGCCGGCTTCGCCATCCTGAAGTGCAACGACA
AGAAGTTCAACGGCACCGGCCCCTGCACCAACGTGTCCACCGTGCAGTGC
ACCCACGGCATCCGCCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTC
CCTGGCCGAGGAGGAGGTGGTGATCCGCTCCGAGAACTTCACCGACAACG
CCAAGACCATCATCGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACC
CGCCCCAACAACAACACCCGCAAGTCCATCCACATCGGCCCCGGCCGCGC
CTTCTACACCACCGGCGAGATCATCGGCGACATCCGCCAGGCCCACTGCA
ACATCTCCCGCGCCAAGTGGAACAACACCCTGAAGCAGATCGTGAAGAAG
CTGCGCGAGCAGTTCGGCAACAAGACCATCGTGTTCAACCAGTCCTCCGG
CGGCGACCCCGAGATCGTGATGCACTCCTTCAACTGCGGCGGCGAGTTCT
TCTACTGCAACACCACCCAGCTGTTCAACTCCACCTGGAACGACAACGGC
ACCTGGAACAACACCAAGGACAAGAACACCATCACCCTGCCCTGCCGCAT
CAAGCAGATCATCAACATGTGGCAGGAGGTGGGCAAGGCCATGTACGCCC
CCCCCATCCGCGGCCAGATCCGCTGCTCCTCCAACATCACCGGCCTGCTG
CTGACCCGCGACGGCGGCAACAACAACAACGACACCGAGATCTTCCGCCC
CGGCGGCGGCGACATGCGCGACAACTGGCGCTCCGAGCTGTACAAGTACA
AGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGC
CGCGTGGTGCAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCATGTTCCT
GGGCTTCCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATGACCC
TGACCGTGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGAAC
AACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGCAGCTGACCGT
GTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACC
TGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATC
TGCACCACCACCGTGCCCTGGAACGCCTCCTGGTCCAACAAGTCCCTGGA
CGAGATCTGGGACAACATGACCTGGATGGAGTGGGAGCGCGAGATCGACA
ACTACACCTCCCTGATCTACACCCTGATCGAGGAGTCCCAGAACCAGCAG
GAGAAGAACGAGCAGGAGCTGCTGGAGCTGGACAAGTGGGCCTCCCTGTG
GAACTGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCA
TGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCC
ATCGTGAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCG
CCTGCCCGCCCCCCCGCGGCCCCGACCGCCCCGAGGGCATCGAGGAGGAGG
GCGGCGAGCGCGACCGCGACCGCTCCGGCCGCCTGGTGGACGGCTTCCTG
GCCCTGATCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCG
CCTGCGCGACCTGCTGCTGATCGTGACCCGCATCGTGGAGCTGCTGGGCC
GCCGCGGCTGGGAGGTGCTGAAGTACTGGTGGAACCTGCTGCAGTACTGG
TCCCAGGAGCTGAAGAACTCCGCCGTGTCCCTGCTGAACGCCACCGCCAT
CGCCGTGGCCGAGGGCACCGACCGCGTGATCGAGGTGGTGCAGCGCGCCT
GCCGCGCCATCCTGCACATCCCCCGCCGCATCCGCCAGGGCCTGGAGCGC
GCCCTGCTGTAA
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Fig. 20B

B.con.env (subtype B consensus env. The amino acid sequence is
different from Los Alamos Database August 2002)

```
GCCG CCGCCATGCG CG TGAAGGG CA TCC GCAAGAA CTACCAG CAC CTGTG
GCGC TGGGG CA CCA TG CTGCT GGGCATG CTGATGA TCTGC TC CGC CG CCG
AGAAG CTGTGGG TGACC GTGTA CTACGG CG TGC CCGTGTG GAAGGAGGC C
ACCA CCACC CTGTT CT GCGCC TCCGACG CCAAGGC CTACGACACC GAGG T
GCACAA CGT GTGGG CC ACCCA CG CCTGC GTGCCCA CCGAC CCCAA CCCCC
AGGA GGTGG TG CTGGA GAACG TGACC GA GAA CTTCAA CAT GTGGAAGAA C
AACA TGGTGGA GCAGA TGCACGA GGACA TCATC TC CCTGT GGGAC CAGTC
C CTGAAGCC CTGCGT GAAGC TGA CCCC CCT GTGCGTGACC CTGAA CTGCA
CCGA CCTGAAGAACAA CCTGC TGAACAC CAACT CCTCCTC CGGCGAGAAG
ATGGAGAAG GG CGAGA TCAAGAA CTGCT CCTTCAA CATCA CCACC TCCAT
CCGCGA CAAGG TGCAGAAGGA GTACGCC CTGTT CTACAAG CTGGACG TGG
TGCC CATCGACAACAA CAACAACAC CTC CTACCGC CTGAT CTCCTGCAAC
ACCT CCGTGATCAC CCAGGCCTGC CC CAAGGTGTC CTTCGAGCCCAT CCC
CATC CACTA CTGCGCC CCCGCCGGC TTCGC CATCC TGAAG TGCAA CGACA
AGAA GTTCAACGGCAC CGGCCCC TGCACCAA CGTGTCCAC CG TGCAG TGC
ACCCA CGGCAT CCGCC CCGTGGTGT CCA CC CAG CTGCT GCTGAACGG CTC
C CTGGCCGA GGAGGAG GTGGTGA TC CGC TC CGAGAA CTTCAC CGA CAACG
CCAAGACCAT CATCGTGCAG CT GAA CGAG TCCGTG GAGAT CAACTGCACC
CGCC CCAACAA CAACA CCCGCAAGT CCA TC CACAT CGGCC CCGGC CGCGC
CTTC TACAC CA CCGGC GAGAT CA TCGGC GA CAT CCGCCAGGC CCA CTGCA
ACAT CT CCC GCGCCAA GTGGAACAA CAC CCTGAAG CAGAT CG TGAAGAAG
CTGCGCGAG CA GTT CGGCAACAA GA CCA TCGTGTT CAA CCAG TCC TC CGG
CGGCGA CCC CGAGA TC GTGAT GCACT CC TT CAA CTGCGGCGG CGAGTTCT
TCTA CTGCAACACCAC CCAGC TGTT CAA CT CCACCTGGAA CGACAACGGC
ACCT GGAACAA CACCAAGGACAAG AACA CCATCAC CCTGC CCTGC CGCAT
CAAG CAGAT CA TCAACATGTGGCAGGAG GT GGGCAAGGCCATGTA CG CCC
CCCC CATCCGCGGCCA GATCCGCTGCTC CT CCAACATCAC CGGCCTG CTG
CTGAC CCGCGAC GGCGG CAACAAC AACAA CGACAC CGAGA TC TTC CG CCC
CGGCGG CGG CGA CATG CGCGA CAAC TGG CG CTC CGAGCTG TA CAAGTACA
AGGT GGTGAAGATCGA GCCCC TGGGCGT GG CCCCCACCAA GG CCAAG CGC
CGCGTGGTG CA GCG CGAGAAGCG CGCCG TGGGCAT CGGCG CCATG TT CCT
GGGCTT CCTGGGCGCCGCCGG CT CCACCATGGGCG CCGCC TC CAT GACCC
TGAC CG TG CAGGC CCGCCAG CTG CTGTC CGGCATCGTGCAGCAGCAGAA C
AACC TGCTG CG CGCCA TCGAGGC CCAGCAG CACCTGCTGCAG CTGACCG T
GTGGGG CAT CAAGCAG CTGCAGGC CCGC GTGCTGG CCGTGGAGCG CTAC C
TGAA GGACCAG CAG CT GCTGGGCAT CTG GGGCTGCTC CGG CAAGC TGAT C
TGCA CCACCAC CGTGC CCTGGAACGC CT CCTGGTC CAACAA GTCC CTGGA
CGAGA TCTGGGA CAA CATGA CCTGGA TGGAG TG GGAGCGC GAGAT CGACA
ACTA CACCT CC CTGAT CTACACC CT GAT CGAGGAG TCCCA GAAC CAG CAG
GAGAAGAAC GA GCAGGAG CTG CT GGAGCTG GACAA GTGGG CC TCC CTGTG
GAAC TGGTT CGACA TCACCAA CTGGCTG TGGTA CATCAAGAT CTT CATCA
TGAT CGTGGGC GGCC TGATC GGC CTGCG CATCGTGTT CGC CG TGCTGTC C
A TCGTGAA CCGCG TG CGC CAGGGCTAC TCC CC CC TGTCC TT CCAGAC CCG
CCTG CCCGC CC CCCGCGGC CCC CGAC CGC CC CGAGGGCATC GAGGA GGAGG
GCGG CGAGCGC GACCG CGACCG CTC CGG CCGCCTGGTGGA CGGC TTC CTG
GCCC TGATC TGGGACGACCTGCG CT CCC TGTGCCTGTTCT CCTAC CA CCG
CCTG CG CGA CC TGCTG CTGAT CG TGACC CG CAT CG TGGAG CTG CT GGGC C
GC CGCGG CT GG GAGGT GCTGAAGTACTGG TGGAAC CTGCTGCAGTAC TGG
TCCCAGGAG CTGAAGAACTC CGC CG TGT CC CTGCTGAACG CCACC GC CAT
CGCCGTGGC CGAGGGCACCGA CCGCGTGAT CGAGG TGGTG CAGCG CGCCT
GCCG CGCCA TC CTGCA CATCCC CCG CCG CA TCCGC CAGGG CC TGGAGCG C
GCCC TGCTG TAA
```

Fig. 20C

B.con.gag (subtype B consensus gag)

MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQT
GSEELRSLYNTVATLYCVHQRIEVKDTKEALEKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQG
QMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAA
EWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIV RMYSPT
SILDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTAC
QGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFRNQRKTVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEG
HQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEESFRGEETTTPSQKQEPIDKELYPLASLR
SLFGNDPSSQ

Fig. 20D

B.con.env (subtype B consensus env)

MRVKGIRKNYQHLWRWGTMLLGMLMICSAAAEKLWVTVYYGVPVWKEATTTLFCASDAKAYDTEVHNVWAT
HACVPTDPNPQEVVLENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLKNNLLNT
NSSSGEKMEKGEIKNCSFNITTSIRDKVQKEYALFYKLDVVPIDNNNNTSYRLISCNTSVITQACPKVSF
EPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAEEEVVIRSENFTDN
AKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQIVKKLRE
QFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNDNGTWNNTKDKNTITTLPCRIKQIINM
WQEVGKAMYAPPIRGQIRCSSNITGLLLTRDGGNNNNDTEIFRPGGGDMRDNWRSELYKYKVVKIEPLGV
APTKAKRRVVQREKRAVGIGAMFLGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNLLRAIEAQQHLL
QLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTTVPWNASWSNKSLDEIWDNMTWMEWEREID
NYTSLIYTLIEESQNQQEKNEQELLELDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVN
RVRQGYSPLSFQTRLPAPRGPDRPEGIEEGGERDRDRSGRLVDGFLALIWDDLRSLCLFSYHRLRDLLL
IVTRIVELLGRRGWEVLKYWWNLLQYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQRACRAILHIPRR
IRQGLERALL

Fig. 21
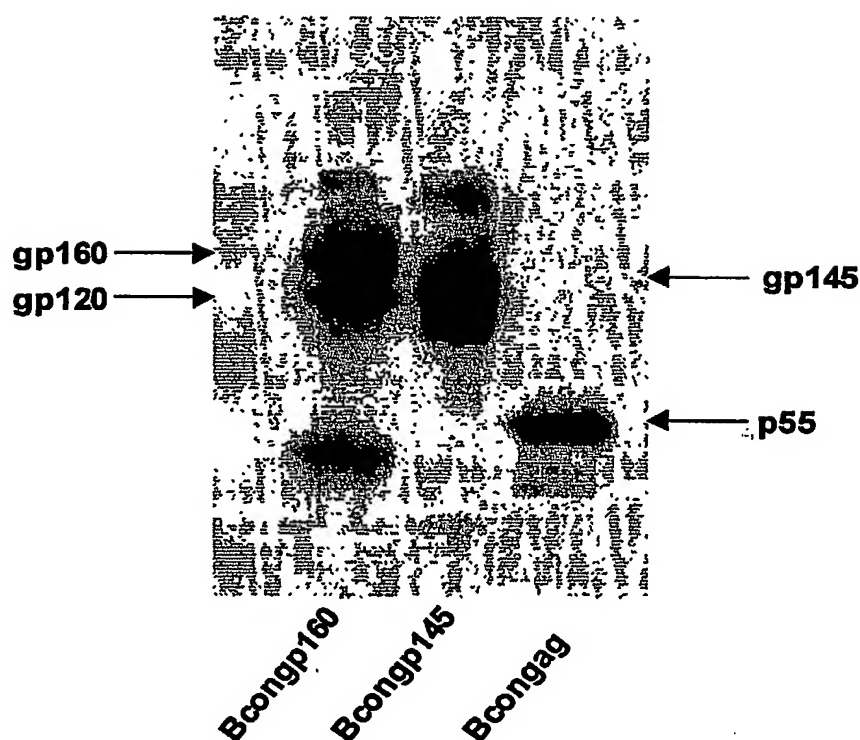
Expression of subtype B consensus *env* and *gag* genes in 293T cells. Plasmids containing codon-optimized subtype B consensus *gp160, gp140,* and *gag* genes were transfected into 293T cells, and protein expression was examined by Western Blot analysis of cell lysates. 48-hours post-transfection, cell lysates were collected, total protein content determined by the BCA protein assay, and 2 μg of total protein was loaded per lane on a 4-20% SDS-PAGE gel. Proteins were transferred to a PVDF membrane and probed with serum from an HIV-1 subtype B infected individual.

Fig. 22
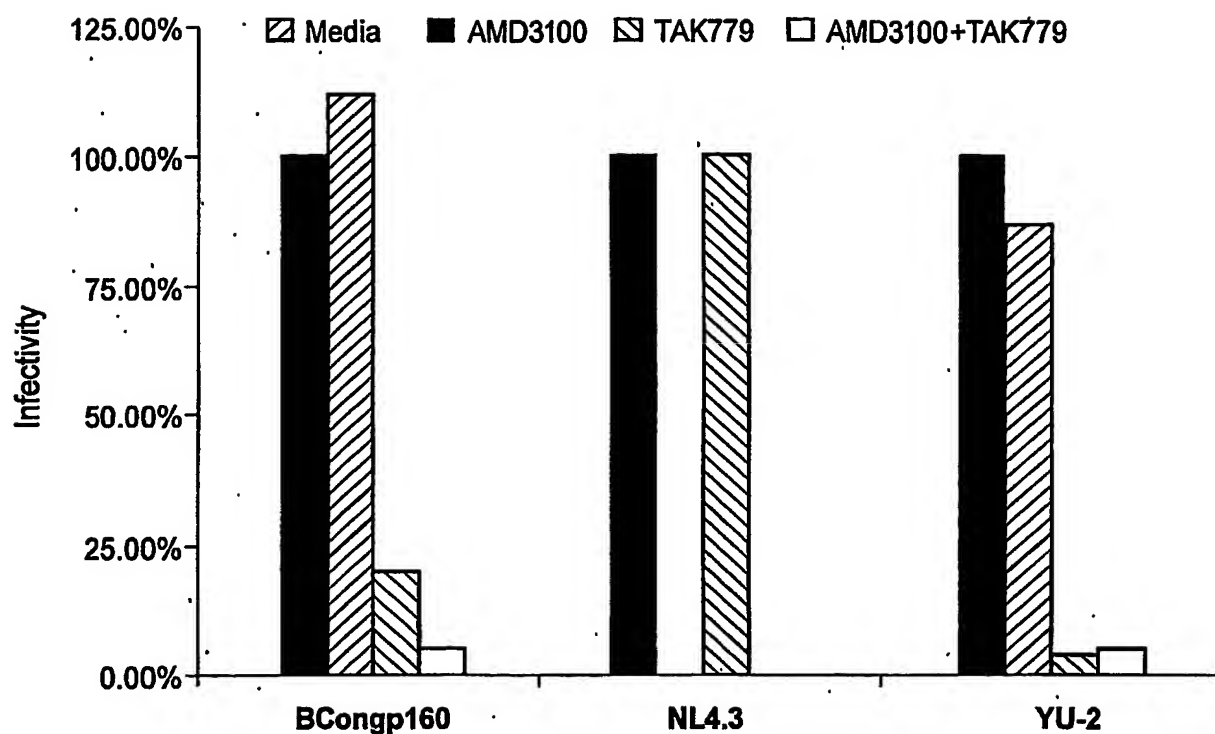
Co-receptor usage of subtype B consensus envelopes.
Pseudotyped particles containing the subtype B consensus gp160 Env
were incubated with DEAE-Dextran treated JC53-BL cells in the   .
presence of AMD3100 (a specific inhibitor of CXCR4), TAK779 (a
specific inhibitor of CCR5), and AMD3000+TAK779 to determine co-
receptor usage. NL4.3, an isolate known to utilize CXCR4 and YU-2,
a known CCR5-using isolate; were included as controls.

Fig. 23A
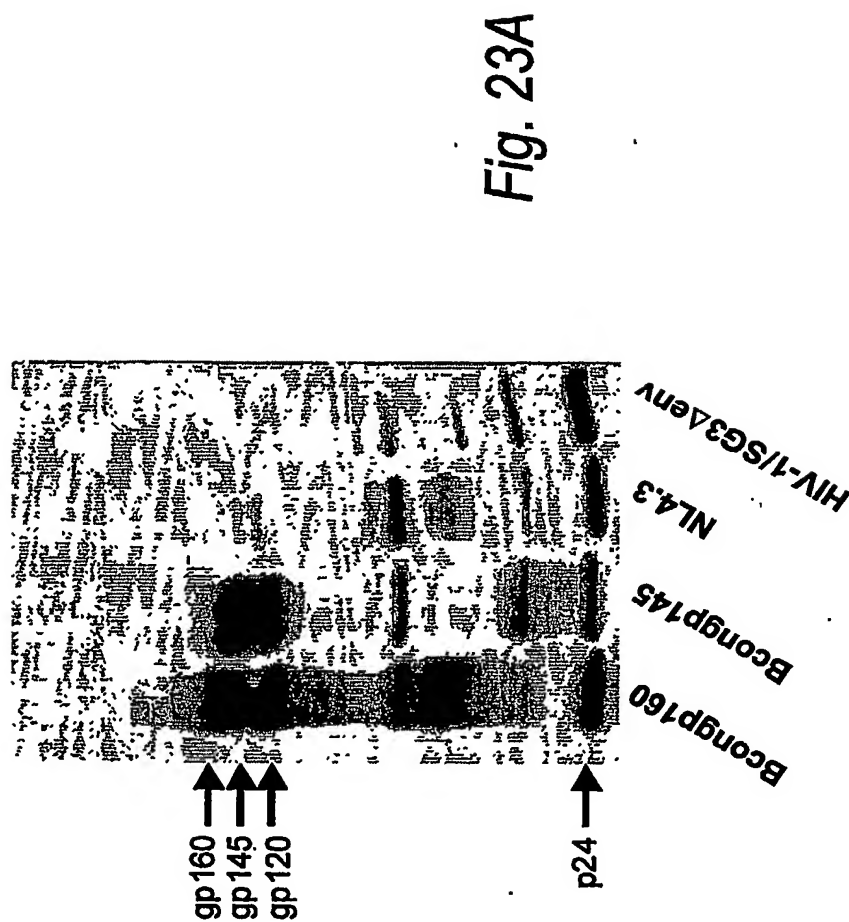
Trans complementation of env-deficient HIV-1 with codon-optimized subtype B consensus gp160 and gp140 genes.

Plasmids containing codon-optimized, subtype B consensus gp160 or gp140 genes were co-transfected into 293T cells with an HIV-1/SG3Δenv provirus. 48-hours post-transfection cell supernatants containing pseudotyped virus were harvested, clarified in a tabletop centrifuge, filtered through a 0.2μM filter, and pellet through a 20% sucrose cushion. Quantification of p24 in each virus pellet was determined using the Coulter HIV-1 p24 antigen assay; 25ng of p24 was loaded per lane on a 4-20% SDS-PAGE gel. Proteins were transferred to a PVDF membrane and probed with anti-HIV-1 antibodies from infected HIV-1 subtype B patient serum. Trans complementation with a rev-dependent NL4.3env was included for control.

Fig. 23B

Infectious Units/ng p24

BCgp160/SG3 BCgp145/SG3 Rev-NL4.3/S G3 SG3Δenv
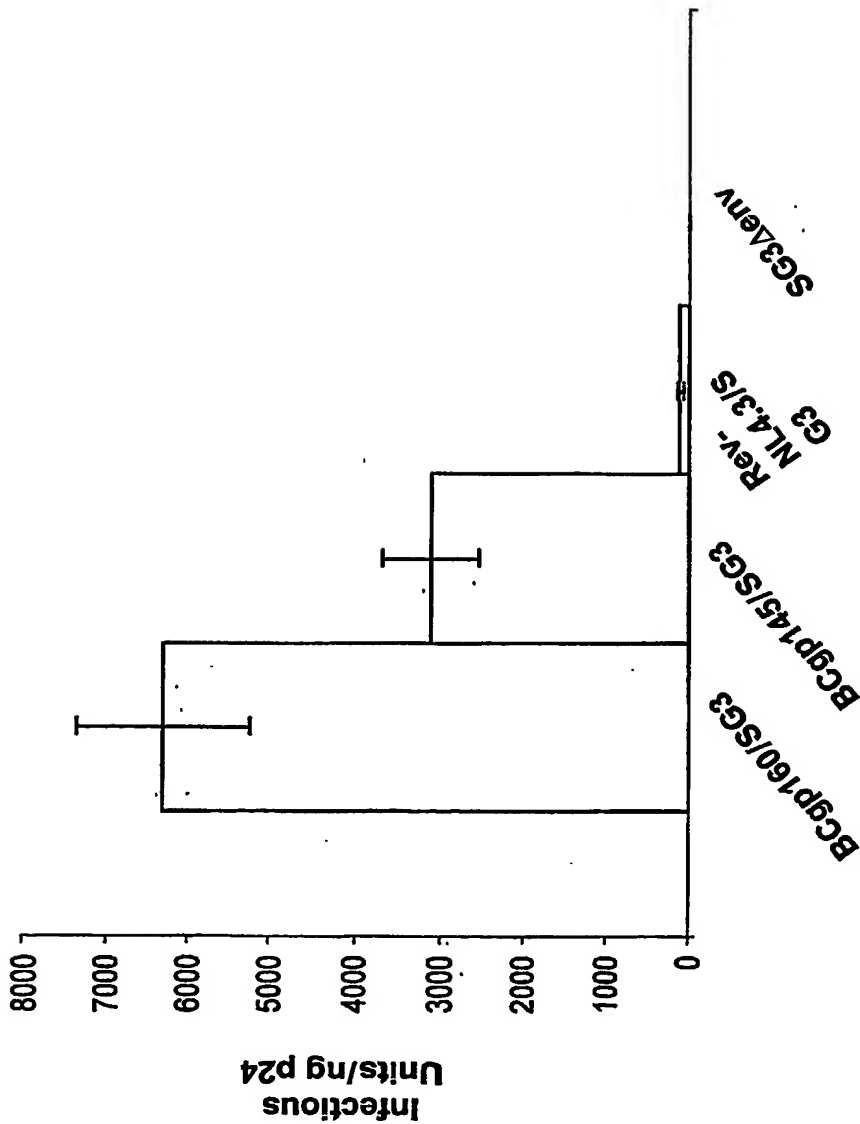
Infectivity of virus particles containing the subtype B concensus envelope.
Infectivity of pseudotyped virus containing consensus B gp160 or gp140 was determined using the JC53-BL assay. Sucrose cushion purified virus particles were assayed by the Coulter p24 antigen assay, and 5-fold serial dilutions of each pellet were incubated with DEAE-Dextran treated JC53-BL cells. Following a 48-hour incubation period, cells were fixed and stained to visualize β-galactosidase expressing cells. Infectivity is expressed as infectious units per ng of p24.
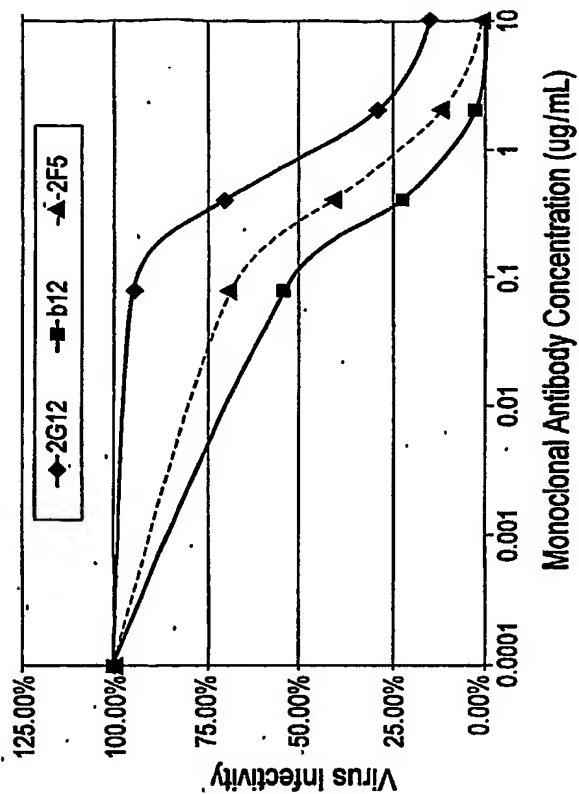
Fig. 24B.

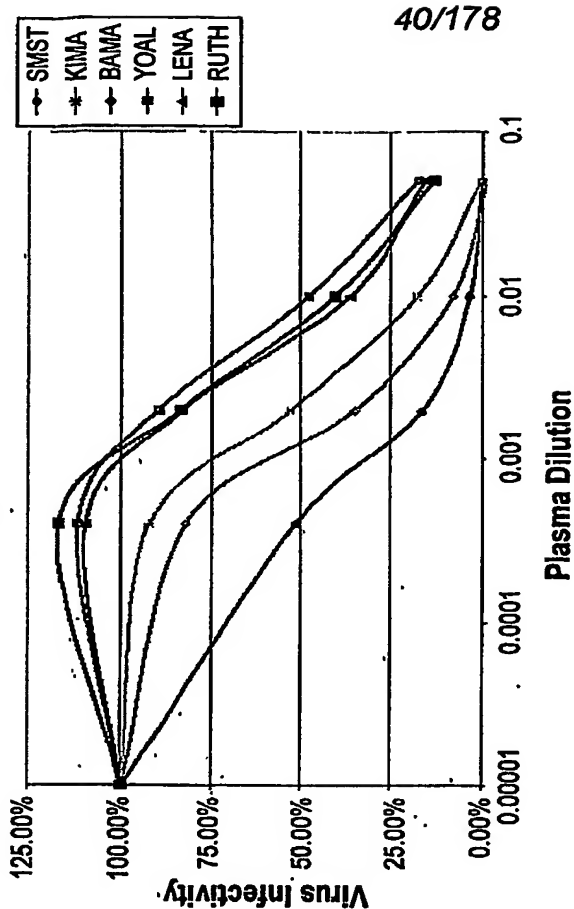Neutralization of Pseudovirions containing
NL4.3 Env (gp160)

Fig. 24A
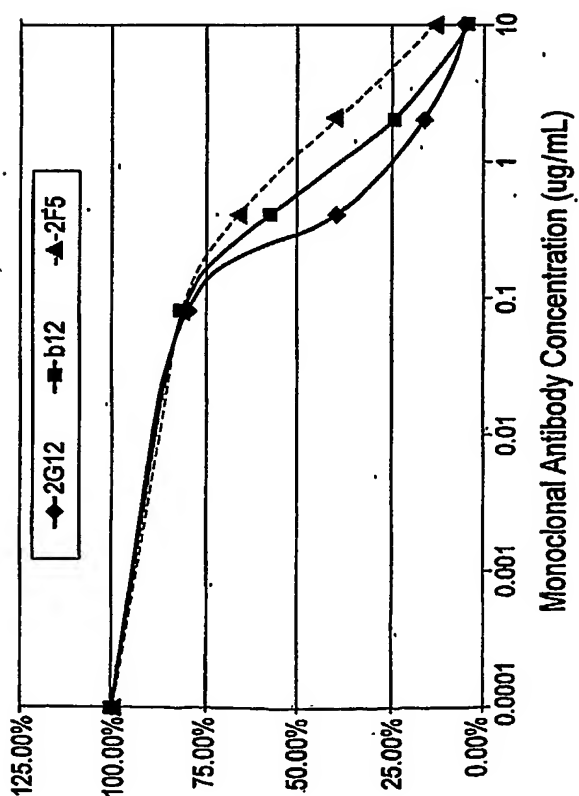
Neutralization of Pseudovirions containing Subtype B
consensus Env (gp160)

Fig. 24D

Neutralization of Pseudovirions
containing NL4.3 Env (gp160)

Fig. 24C

Neutralization of Pseudovirions containing
Subtype B consensus Env (gp160)

Neutralization sensitivity of virions containing subtype B concensus gp160 envelope.

Equivalent amounts of pseudovirions containing the subtype B consensus or NL4.3 Env (gp160) (1,500 infectious units) were preincubated with three different monoclonal neutralizing antibodies and a panel of plasma samples from HIV-1 subtype B infected individuals, and then added to the JC53-BL cell monolayer in 96-well plates. Plates were cultured for two days and luciferase activity was measured as an indicator of viral infectivity. Virus infectivity was calculated by dividing the luciferase units (LU) produced at each concentration of antibody by the LU produced by the control infection. The mean 50% inhibitory concentration (IC_{50}) and the actual % neutralization at each antibody dilution were then calculated for each virus. The results of all luciferase experiments were confirmed by direct counting of blue foci in parallel infections.
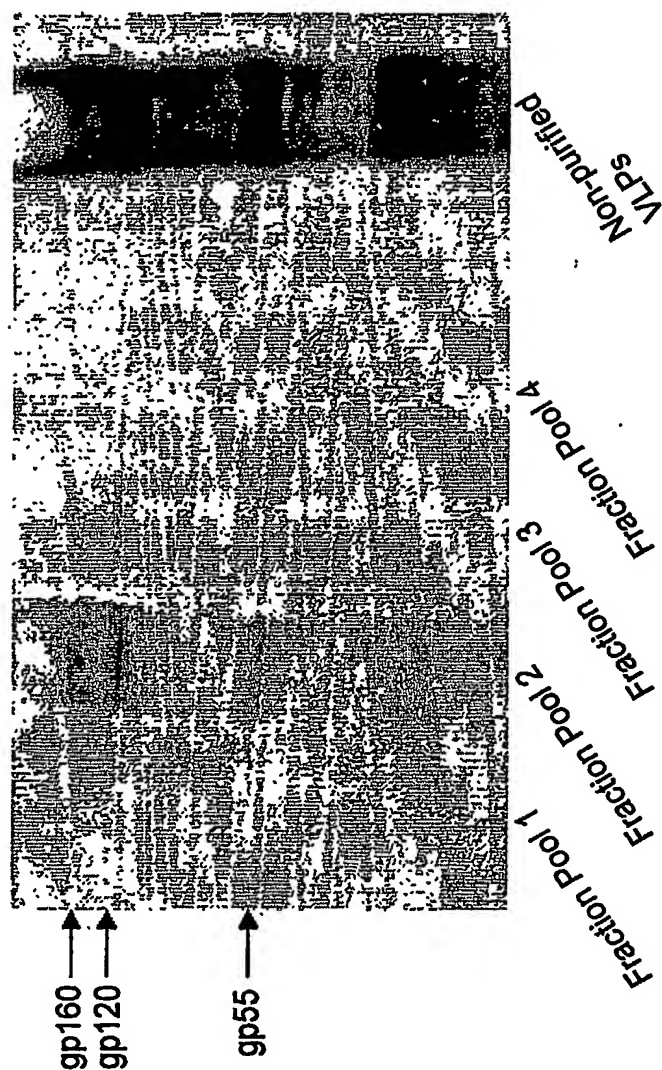
Fig. 25A
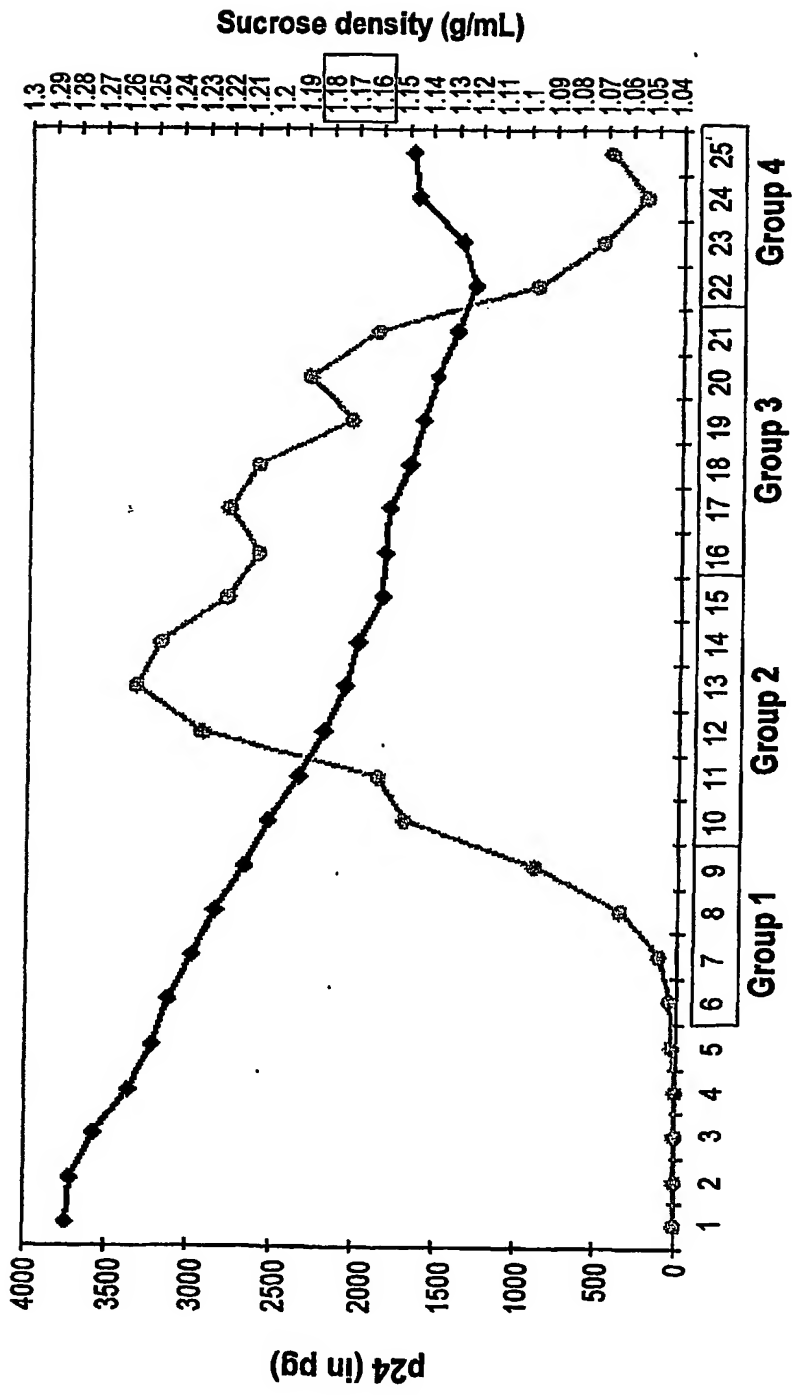
Density and p24 analysis of sucrose gradient fractions.

0.5ml fractions were collected from a 20-60% sucrose gradient. Fraction number 1 represents the most dense fraction taken from the bottom of the gradient tube. Density was measured with a refractometer and the amount of p24 in each fraction was determined by the Coulter p24 antigen assay. Fractions 6-9, 10-15, 16-21, and 22-25 were pooled together and analyzed by Western Blot. As expected, virions sedimented at a density of 1.16-1.18 g/ml.

Fig. 25B

gp160
gp120

gp55

Fraction Pool 1

Fraction Pool 2

Fraction Pool 3

Fraction Pool 4

VLPs

Non-purified

VLP production by co-transfection of subtype B consensus *gag* and *env* genes.

293T cells were co-transfected with subtype B consensus *gag* and *env* genes. Cell supernatants were harvested 48-hours post-transfection, clarified through at 20% sucrose cushion, and further purified through a 20-60% sucrose gradient. Select fractions from the gradient were pooled, added to 20ml of PBS, and centrifuged overnight at 100,000 x g. Resuspended pellets were loaded onto a 4-20% SDS-PAGE gel, proteins were transferred to a PVDF membrane, and probed with plasma from an HIV-1 subtype B infected individual.

Fig. 26A

Year 2000 Con-S 140CFI.Env

MRVRGIQRNCQHLWRWGTLILGMLMICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVH
NVWATHACVPTDPNPQEIVLENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNC
TNVNVTNTTNNTEEKGEIKNCSFNITTEIRDKKQKVYALFYRLDVVPIDDNNNNSSNYRLINCNT
SAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNG
SLAEEEIIIRSENITNNAKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQA
HCNISGTKWNKTLQQVAKKLREHFNNKTIIFKPSSGGDLEITTHSFNCRGEFFYCNTSGLFNSTW
IGNGTKNNNNTNDTITLPCRIKQIINMWQGVGQAMYAPPIEGKITCKSNITGLLLTRDGGNNNTN
ETEIFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKLTVQARQLLSGIVQQQSNLLRAIEAQ
QHLLQLTVWGIKQLQARVLAVERYLKDQQLEIWDNMTWMEWEREINNYTDIIYSLIEESQNQQEK
NEQELLALDKWASLWNWFDITNWLW

A gp140 CFI is referred to HIV-1 envelope design with the cleavage-site-deleted (C), fusion-site-deleted (F) and gp41 immunodominant region-deleted (I) in addition to the deletion of transmembrane and cytoplasmic domains.

Fig. 26B

Codon-optimized Year 2000 Con-S 140CFI. seq

ATGCGCGTGCGCGGCATCCAGCGCAACTGCCAGCACCTGTGGCGCTGGGGCACCCTGATCCTGGG
CATGCTGATGATCTGCTCCGCCGCCGAGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGT
GGAAGGAGGCCAACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGTGCAC
AACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGCTGGAGAA
CGTGACCGAGAACTTCAACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCT
CCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACTGC
ACCAACGTGAACGTGACCAACACCACCAACAACACCGAGGAGAAGGGCGAGATCAAGAACTGCTC
CTTCAACATCACCACCGAGATCCGCGACAAGAAGCAGAAGGTGTACGCCCTGTTCTACCGCCTGG
ACGTGGTGCCCATCGACGACAACAACAACAACTCCTCCAACTACCGCCTGATCAACTGCAACACC
TCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCGCCCC
CGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCAACGGCACCGGCCCCTGCAAGAACG
TGTCCACCGTGCAGTGCACCCACGGCATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGC
TCCCTGGCCGAGGAGGAGATCATCATCCGCTCCGAGAACATCACCAACAACGCCAAGACCATCAT
CGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAACAACAACACCCGCAAGTCCA
TCCGCATCGGCCCCGGCCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCC
CACTGCAACATCTCCGGCACCAAGTGGAACAAGACCCTGCAGCAGGTGGCCAAGAAGCTGCGCGA
GCACTTCAACAACAAGACCATCATCTTCAAGCCCTCCTCCGGCGGCGACCTGGAGATCACCACCC
ACTCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACTCCACCTGG
ATCGGCAACGGCACCAAGAACAACAACAACACCAACGACACCATCACCCTGCCCTGCCGCATCAA
GCAGATCATCAACATGTGGCAGGGCGTGGGCCAGGCCATGTACGCCCCCCCCATCGAGGGCAAGA
TCACCTGCAAGTCCAACATCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACAACAACACCAAC
GAGACCGAGATCTTCCGCCCCGGCGGCGGCGACATGCGCGACAACTGGCGCTCCGAGCTGTACAA
GTACAAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCTTACCGTGCAGG
CCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGTCCAACCTGCTGCGCGCCATCGAGGCCCAG
CAGCACCTGCTGCAGCTGACCGTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGA
GCGCTACCTGAAGGACCAGCAGCTCGAGATCTGGGACAACATGACCTGGATGGAGTGGGAGCGCG
AGATCAACAACTACACCGACATCATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAG
AACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCACCAA
CTGGCTGTGGTGAGGATCC

Fig. 27

Individual C56BL/6 Mouse T Cell Responses to HIV-1 Envelope Peptides

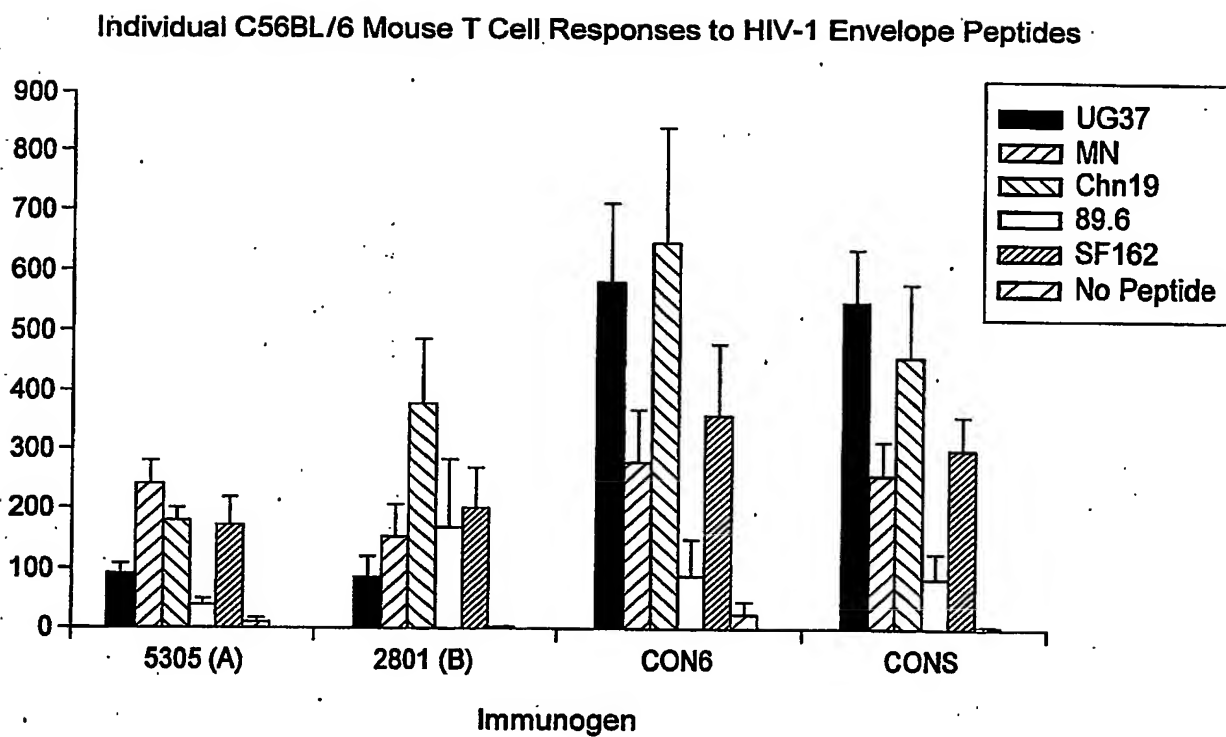## Fig. 28A

Design of expression-optimized HIV-1 envelope gp140CF

Con-B-2003 Env.pep (841 a.a.)*

MRVKGIRKNYQHLWRWGTMLLGMLMICSAAEKLWVTVYYGVPVWKEATTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLMNATNTNTTIIYRWRGEIKNCSFNITTSIRDKVQKEY
ALFYKLDVVPIDNDNTSYRLISCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIRPVVSTQ
LLLNGSLAEEEVVIRSENFTDNAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQ
IVKKLREQFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPP
IRGQIRCSSNITGLLLTRDGGNNETEIFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAMFLGFLGA
AGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPW
NASWSNKSLDEIWDNMTWMEWEREIDNYTSLIYTLIEESQNQQEKNEQELLELDKWASLWNWFDITNWLWYIKIFIMIVGGLVGL
RIVFAVLSIVNRVRQGYSPLSFQTRLPAPRGPDRPEGIEEEGGERDRDRSGRLVDGFLALIWDDLRSLCLFSYHRLRDLLLIVTR

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 28B

Con-B-140CF.pep (632 a.a.)
Nick name: 002

MRVKGIRKNYQHLWRWGTMLLGMLMICSAAEKLWVTVYYGVPVWKEATTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLMNATNTNTTIIYRWRGEIKNCSFNITTSIRDKVQKEY
ALFYKLDVVPIDNDNTSYRLISCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIRPVVSTQ
LLLNGSLAEEEVVIRSENFTDNAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQ
IVKKLREQFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPP
IRGQIRCSSNITGLLLTRDGGNNETEIFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKTLTVQARQLLSGIVQQQNNLLRA
IEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPWNASWSNKSLDEIWDNMTWMEWEREIDNYTSLIY
TLIEESQNQQEKNEQELLELDKWASLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 28C

Codon-opitmized Con-B 140CF.seq (1927 nt.)

Nick name: 002

```
TTCAGTCGACGGCCACCATGAGGGTGAAGGTATTCGGAAAAATTACCAACACCTGTGGCGCTGGGGAACCATGCTCCTTGGTAT
GCTGATGATTGCAGTGCCGCCGAGAAACTTTGGGTAACTGTGTACTACGGCGGTTCCTGTCTGGAAGGAAGCTACAACCACTCTT
TTTTGTCATCCGACGCTAAAGCTTACGACACAGAGAATTTGGGCCACCATGTTTGGGCCGTCCCTACAGATCCCAACC
CCCAGGAAGTCGTCCTTGAGAATGTCACAGAGCCCTGCGTGAAACTCCACTTCGCTGAAACAAATGCACGAAGACATTAT
TAGCCCTGTGGGACCAGTCCTTGAAGCCCTGCGTGAAACTCCACTTCGCTGAAACTGTACTGATTTGATGAACGCA
ACCAACACAAATACTACTATTATATATCGCTGGAGGGGGAAATCAAGAAGTGCTCTTTCAACATCACCACTTCCATAAGGATA
AGGTCCAGAAGAGAATATGCCCTGTTTTATAAACTTGATGTGGTCCCGATAGACAATGACAACACTACTAGCTATCGACTGATCTCTTG
TAACACATCCGTGATTACCCAAGCTTGCCCAAAGGTCAGCTTTGAACCAATACCAATCCACTACTCCACCGTGCAATGTACTCACGGAATCAGAC
ATCCTCAAGTGTAAGCGACAAACTCCTCTTGAACTGGGACGGGTCTCGCGGAAGGAGAGGTCGTGATTAGAAGCGGAAAACTTTACCGATAACGC
CTGTTGTCAGTGCAGTCCAACTTTATACAACTGGCGAAATCATTGGTGACATCAGAGACAGCTCAATATCTCCCGCGCGAAATGGA
ACAACACCCTGAGAAACAGATCGTGAAGAAACTTCGAGAAGCAATTCGGTAATAAAACAATCGTATTCAACAACGTGTAATAGCACTTGGAAT
CCCTGAGATAGTTATGCACTCAACTGTGGCGGCGAGTTCTTCTTCTCCGGATTAAGCAGATCATTAATATGTGGCAAGAAGTGGGAAAAG
GGAACATGGAACAACAGAAGGAACATCACTCGCCTTGTGCCTTGCCACTCTGCCTTGTTCGCGGACACAATAAGATGCTCTAGTAATATTACCGGATTGTTGCTGACACGGCAGAAGTGGGAGGAAATAA
CTATGTACGCCCCGCCTATTCGCGCGGAGGCCGGACAAATAGATGCTCTAGTAATATTACCGGATTGTTGCTGACACGGCAGAAGTGGGAGGAAATAA
TGAAACAGAGATATTTAGACCTGGCCGGAGGCCGGACAAATAGATGCTCTAGTAATATTACCGGATTGTTGCTGACACGGCAGAAGTGGGAGGAAATAA
GAACCATTGGGGGTAGCACCAACCAACCAAAGCAACAACAACCTTGACAGAGAAGTAACTGACAGTACAGTAGCCGGAATCAAACAGCTTCAGCGAAGGCAAGAGTGCT
ATAATCTTCTCCGAGAGATACCTCAAAGATCAAGATCAACAACATCGTGCTGGGCATATTGGGACAACAGCTTGGGACGGGAAATTGACAACT
GGCCGTCGAGCCGAGCTGGTTCTAATAAATCCCTGAGGAAGAATCTCAGAACCAACAGGAGAAAACGAACAGGAACTGCTGGAACTGGACAAGTG
TGGAACGGCGAGCTGGTTTGATTTATACTCTGATCGAAGAATCTCAGAACCAACAGGAGAAAACGAACAGGAACTGCTGGAACTGGACAAGTG
ATACTAGTTGATTTATACTCTGATCGAAGAATCTCAGAACCAACAGGAGAAAACGAACAGGAACTGCTGGAACTGGACAAGTG
GGCATCATTGTGGAACTGGTTTGACATTACTAACTGGCCTGTGTGGTAAAGATCTTACAA
```

(For all 140CF design shown here and below, 140CF gene will be flanked with the 5' sequence of "TTCAGTCGACGGCCACC" that contains a Kozak" sequence (GCCACCATGG/A) and *SalI* site and 3' sequence of TAAAGATCTTACAA containing stop codon and *BglII* site.)

Fig. 29A

CON OF CON-S-2003 (829 a.a.)

MRVMGIQRNCQHLWRWGILIFGMLIICSAAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTTNNEEIKNCSFNITTEIRDKKKKVYALFYKL
DVVPIDDNNSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSL
AEEEIIIRSENITNNAKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLQQVAKKLRE
HFNKTIIFNPSSGGDLEITTHSFNCGGEFFYCNTSELFNSTWNGTNNTITTLPCRIKQIINMWQGVGQAMYAPPIEGKIRCTSNIT
GLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITL
TVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEI
WDNMTWMEWDKEINNYTDIIYSLIEESQNQQEKNEQELLALDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNR
VRQGYSPLSFQTLIPNPRGPDRPEGIEEGGEQDRDRSIRLVNGFLALAWDDLRSLCLFSYHRLRDLILIAARTVELLGRRGWEA
LKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRVCRAILNIPRRIRQGFERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 29B

CON-S-2003 140CF.pep (620 a.a.).
Nick name: 006

MRVMGIQRNCQHLWRWGILIFGMLIICSAAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTTNNEEIKNCSENITTEIRDKKKKVYALFYKL
DVVPIDDNNSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSL
AEEEIIIRSENITNNAKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLQQVAKKLRE
HFNKTIIFNPSSGGDLEITTHSFNCGGEFFYCNTSELFNSTWNGTNNTITTLPCRIKQIINMWQGVGQAMYAPPIEGKIRCTSNIT
GLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKTLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTV
WGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMEWDKEINNYTDIIYSLIEESQNQQEK
NEQELLALDKWASLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

Fig. 29C

CODON-OPTIMIZED CON-S-2003 140CF.seq (1891 nt)
Nick name :006

```
TTCAGTCGACAGCAGCCACCATGCGCGGTCATGGGGATACAGAGGAATTGCCAGCACTTGTGGAGTGGGGAATTTTGATATTCGGGAT
GCTCATAATCTGCTCTGCCGCTGAGAACCTGTGTGGGTCACTGTTATTACGGCGTTCCCGTCTGGAAAGAAGCTAATACTACCCTG
TTTTGTGCAAGCGACGCCCAAAGCATACGACACCGAGTCCACAATGTCTGGGCTACCCACGCCCTGTGTACCTACTGATCCAAATC
CCCAGGAAATTGTTCTTGAAAACGTAACGGAAAACTTTAACATGTGGAAGAATAATATGTGGAGCAAATGCACGAGGATATAAT
CAGCCTGTGGGACCAGTCCCTCAAACCATGCGTTAAACTCACTCCACTCTGCTGCTGTGACTCTGAACTGTACCGACGTGAACGCAACC
AATAATACAACAACAATGAGGAGATAAAGAATTGTTCATTTAATATAACCACTGAGATACGGGATAAGAAAAAAAGGTTTATG
CACTCTTTTACAAGCTCGACGTGGTGCCCATAGACGAATAATAGCTACCGACTCATTAATTGCAATACTAGCGCTATAACCCA
GGCATGCCCCAAAGTTCCTTCGAGCCCATACCGATTCACTACTGCGCACCCGCCGATTCGCCATTCTTAAATGCAATGACAAG
AAGTTCAACGGCCACCGGACCCTGTAAGAACGTAAGCACTGTTCAATGTACACATGGAATTAAGCCGGTAGTGTCAAGCGCAGCTCC
TCCTCAACGGAAGCCTTGCAGAGAAGAGATCATTATCAGGTCAGAAAATATCACCAACAACGCGAAAACAATCATTGTTCAGCT
GAATGAGTCTGTAGAAATCAATTGTACCCGCCCTAATAATAACAGAGAAAGTCAATTCTAGAACTCAATAACTGGAATAAACTTTGCAGCAGGTAG
GCAACCGGAGATATCATCGGGGATATACGACAGGCCCACTGCAACATCTTCAATCCAAGTGGTAAGTGGAATAAAACTTTGCGAAATCACTACACATTCCTT
TAACTGTGGGGGCGAGTTTTTCTACTGTAATACCTGTAATACCTCTGAACTGTTCAACTCAACATGGGCAGCAATGTATGCACCAATCGAAGGCAAAATAGAT
GCACCTCCAATATTACCGGACTCCTCCGAGCTCTATAAATACAAAGTCGTTAAGATCGAGCCCCTTGGAGTTGCGCCAACCAAAGCTAAAACC
GAGAGATAACTGGCGCTCCGAGCTCCAGCCAGTTGTGTTGTCAGGTATCGTACAGCGACACCTTCAGGCAGCAATCTAATCTTTGAGAGCGCTATTTGAAAGACCACGCACC
TTGACCGTGCAAGCTTACCGTCTCGGGGCATCAAACAACTTCAGGCGACAAATTGATCTGCACGACAGAAATGTGCCTTGAACAGCAGCAGTCTGTCAAATAAAAGCCAAGACGAA
ATATGGGATAACATGACATGGATGGAATGGGATAGAGAAAATTAATAATTACACTGACAATTAATTACTCACTTATCGAGGAATCAC
AAAATCAACAGGAGAAAAAATGAACAGAGAACTCTTGGCTCTCTGGACAAATGGGCTTCACTGGTTCGACATCACAAATTG
GCTCTCGGTAAAGATCTTACAA
```

Fig. 30A

CONSENSUS A1-2003 (845 a.a.)

```
MRVMGIQRNCQHLLRWGTMILGMIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYETEMHNVWATHACVPTDPNPQEIHL
ENVTEEFNMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTTHEEEIKNCSFNMTTELRDKKQKVYSLFY
RLDVVQINENNSNSSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEVIIRSENITNNAKTIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLQKVA
KQLRKYFKNKTIIFTNSSGGDLEITTHSENCGGEFFYCNTSGLFNSTWNNGTMKNTITLPCRIKQIINMWQRAGQAMYAPPIQGV
IRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDNWRSELYKYKVKIEPLGVAPTRAKRRVVEREKRAVGIGAVFLGFLGAAGS
TMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSS
WSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLIEESQNQQEKNEQDLLALDKWANLWNWFDISNWLWYIKIFIMIVGGLIGLRIV
FAVLSVINRVRQGYSPLSFQTHTPNPRGLDRPGRIEEGGGEQGRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVE
LLGHSSLKGLRLGWEGLKYLWNLLLYWGRELKISAINLVDTIAIAVAGWTDRVIEIGQRIGRAILHIPRRIRQGLERALL
```

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 30B

Con-A1-2003 140CF.pep (629 a.a.)
Nick name: 001

```
MRVMGIQRNCQHLLRWGTMILGMIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYETEMHNVWATHACVPTDPNPQEIHL
ENVTEEFNMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTTHEEEIKNCSFNMTTELRDKKQKVYSLFY
RLDVVQINENNSNSSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEVIIRSENITNNAKTIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLQKVA
KQLRKYFKNKTIIFTNSSGGDLEITTHSENCGGEFFYCNTSGLFNSTWNNGTMKNTITLPCRIKQIINMWQRAGQAMYAPPIQGV
IRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDNWRSELYKYKVKIEPLGVAPTRAKTLTVQARQLLSGIVQQQSNLLRAIEA
QQHLLKLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLI
EESQNQQEKNEQDLLALDKWANLWNWFDISNWLW*
```

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 30C

CODON-OPTIMIZED Con-A1-2003.seq
Nick name: 001 (1918 nt)

```
TTCAGTCGACAGCCACCATGAGGGTGATGGGAATCCAACGGAACTGCCAGCATCTTCTCCGGTGGGGAACGATGATACTGGGAAT
GATAATAATCTGCTCTGCCGCTGAAAAACCTCTGGGTCACAGTGTACTACGGAGTGCCTGTATGGAAGGACGCTGAAACCACTCTC
TTTTGTGCTTCCGATGCTAAAGCCTACGAAACCGAGATGCACAATGTTGGGCCACCCACGCCTGCCTGCGTGCCAACTGACATCAATC
CACAAGAAATACATCTGGAGGAATTACTGAGGAATTAACATGTGGAAAAATAATATGGTAGAGCAAATGCACACTGACATCAT
TTCACTCTGGGACCAATCACTCAAACCCTGCGTTAAACTTACCCCCTCTGCGTGACCCTCAATTGTAGCAACGTCACA
AATAATACAACCAACACTCACGAGGAGAAATTAAAAATTGCTCCTTTAATATGACCACTCGCGACAAAAAACAAAAAG
TCTATTCACTGTTTTATAGGCTGGACGTCGTCCAAATCAACGAGAACAATTCTAACAGTAGCTATCGACTTATCAATTGCAATAC
CTCTGCTATTACCCAAGCTTGTCCTAAAGTCTCTTTGAACCAATCCTATCCACTACTGTGCCCCATTGAGCAATCAAACCAGTAG
AAGTGCAAGGATAAGGAATTCAACGGAACTGGCTCCTGAATGGCTCACTCGCCGAAGAAGAGTGATTATCCGAAGAACATAACAATGCGAAGAC
TCAGCACTCAACTGCTCCTGAAATGGCTCACTCGCCGAAGAAGAGTGATTATCCGAAGAACATAACAATGCGAAGAC
GGACAAGCCCTTCAATTGTTCAATTGACGAACCAGTGAAGATCAATCATAGGTGACATCAGACAGGCCCCATTGGCCCC
CACTCCCAGAAGTGGCAAAGCAGCTGAGAAATACTTTAAGAACCAATCATCATATTTACTACCTGGAATAACGGC
AATAACCACTCATAGCTTTAATTGTGTGGGGCGAATTCTTCTACTGTAACACATCTGGCCTTTAATTCTACCTGGAATAACGGC
CTCCCATTCAGTGTGATTCGAATGTGAAAGCAACATTACTTGGCGAAGTGAACTTTATAAATACAAAGTAGTTAAGATTGAGCCCTT
GACATTCAGACCCGGCGGCGATATGCCGAGACAATTGGCAGGCCAGTTCAGGCGAATCGTCAGCAGAAGTAACCTCC
GGAGTTGCCCCTACTAGACAAAAAACAACATCTCTTGGAATCTGGGGATGCTCTGGAAATTGACCGGTGGGGAAATTTGATGCTCGT
TCCGAGCTATCGAGGCACACAACACATCTCTTGGAATCTGGGGATGCTCTGGAAATTGACCGGTATGGGACAAAGAATTTCTAATTATACTCATA
ACGCTATCTCAAGGATCGATCGAAGAACGAAATTCACAGAACCAGCAGAAAAAAGAATGAGCAAGACCTTCTGGCCTTGGACAAGTGGGCTAACTT
GTGGAACTGGTTTGACATTAGCAACTGGCAATTGTCAACTGGCAATTATACTCATA
```

Fig. 31A

CONSENSUS C-2003 (835 a.a)

MRVRGILRNCQQWWIWGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTLFCASDAKAYEKEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEIKNCSFNITTELRDKKQKVYALFYRLDI
VPLNENNSYRLINCNTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAE
EEIIIRSENLTNNAKTIIVHLNESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKWNKTLQKVSKKLKEHF
PNKTIKFEPSSGGDLEITTHSFNCRGEFFYCNTSKLFNSTYNSTNSTITLPCRIKQIINMWQEVGRAMYAPPIAGNITCKSNITG
LLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKVVEIKPLGIAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLT
VQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVWGIKQLQTRVLAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEDIW
DNMTWMQWDREISNYTDTIYRLLEDSQNQQEKNEKDLLALDSWKNLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRV
RQGYSPLSFQTLTPNPRGPDRLGRIEEEGGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARAVELLGRSSLRGL
QRGWEALKYLGSLVQYWGLELKKSAISLLDTIAIAVAEGTDRIIELIQRICRAIRNIPRRIRQGFEAALQ

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design..

Fig. 31B

Con-C 2003 140CF.pep (619 a.a.)
Nick name: 003

MRVRGILRNCQQWWIWGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTLFCASDAKAYEKEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEIKNCSFNITTELRDKKQKVYALFYRLDI
VPLNENNSYRLINCNTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAE
EEIIIRSENLTNNAKTIIVHLNESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKWNKTLQKVSKKLKEHF
PNKTIKFEPSSGGDLEITTHSFNCRGEFFYCNTSKLFNSTYNSTNSTITLPCRIKQIINMWQEVGRAMYAPPIAGNITCKSNITG
LLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKVVEIKPLGIAPTKAKTLTVQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVW
**GIKQLQTRVLAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEDIWDNMTWMQWDREISNYTDTIYRLLEDSQNQQEKN
EKDLLALDSWKNLWNWFDITNWLW***

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 31C

CODON-OPTIMIZED Con-C-2003 140CF (1,888 nt.)
Nick name:003

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TTCAGTCGACAGCCACCATGCGAGTGAGAGGCATTCTGCGCGAATTGTCAGCAATGGTGGATCTGGGCATACTCGGATTCTGGAT
GCTTATGATATGCAATGTTGTGGGGAACCTGTTGGGTTACCGTATACTATGGGGTTCCAGTCTCGGAAGGAGGCTAAAACAACGCTG
TTCTGTGCAAGTGACGCCAAAGCCTACGAGAAGAAGTGCACAACGTCTGGGCTACCCACGCTTGTGTTCCAACCGATCCAAACC
CCCAGGAAATCGTCCTCGAGAACGTGACTGAAAACATTTAACATGTGGAAGAATGATATGGTAGATCAGATGCACGAAGATATCAT
TTCATTGTGGGACCAATCATTGAAACCATGCGTAAAACTGCTAAAAAAACTGTAGCTTTAACATTACAACGGAACTCCGGGATAAGAA
ACCAATACTATGGGCGAAATAAAAAACTGTAGCTTTAACATTACAACGGAACTCCGGGATAAGAAACAAAAGGTCTACGCGCTCT
TTTACCGACTCGATATCGTCCCCACTTAACGAATAATAGTTACCGCCTGATTAACTGTAACACATCAGCCATTACGCAAGCTTG
CCCCAAAGTTTCTTTCGACCCATCCAATTCACTATTGTGCCCCCGCTGGATACGCCTATACTTAAATGCAACAATAAAACATTT
AATGGAACCGGACCATGTAACAACGTCAGTACCGTACAATGTACGCACGGAATTAAACCTGGTTGTCTCAACCCAGCTTCTCCTTA
ATCCGTGGAAATCGTGTGCACCAGACCAAGCCAAATAACAATACCCGGAAATCAATCAGGATTGGGCCTGGAATAAGACTCTGCACCTCAATGA
GGTGATATAATTGGCGATATTAGACAACAAGCCCATTGCAACATATCGAAACAATATCAGAAGAACAAGTGGAATAAGACTCTGCAGAAGGTTTCTAAGA
AGCTGAAGGAACACTTTCCAATAAAACGATTAAGTTCGAGCCTCTTTAACAGTACCTTACAACTCCACTAATAGTACCATCACACTCCCC
TTGTAGAGGGGAGTTCTTCTATTGTAATACATCAAAGCTCTTTAATACATCAAAGCTCTTTAATAGTACCATCACACTCCCC
TGCAGAATAAAAGCAAATAATCAACATGTGCAAGAAGTTGGCCAGAAGAGTTGGCCAGCAATGTCGTTGCAACGCGAGTGGTCGCGGGCGATATGCG
AATCCAATATTACTGGCCTTTTGCTGACAAGTATAAAGTCGTTGCAACAGCAATCCAAATCCAATCTCCTGCGAGCTATCGAAGCCCAACAACATATGC
ACTGTTCAGGCTAGACAGCTGCTCTCCCGGCATCAATGCTGCCTCCTGCGAGCTATCGAAGCCCAACAACATATGC
TCCAGCTTACCGTCTCGGGGAATCAAACAATTGCAAACACGAGTGCTGCCGTGCCGATAGAGAAATCAGCAACTCCTGGG
GATTTGGGCGCTGTTCAGTGAGCTCATCTGTACAACTGCGGGTGCCGTGAACTATAAGCAACTATACAGATACCATTTATCGGCTCCTGGAGGACTCACAGA
TGGGACAACATGAAATGAGAAAATGAGAAAAAATGAGAAAAGATTTGCTCGCGCTTGACAGTTGACATTACAAACTGGCT
CTGGTAAAGATCTTACAA
```

Fig. 32A

CONSENSUS G-2003 (842 a.a.)

MRVKGIQRNWQHLWKWGTLILGLVIICSASNNLWVTVYYGVPVWEDADTTLFCASDAKAYSTERHNVWATHACVPTDPNPQEITL
ENVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNVTNNTNNTKKEIKNCSFNITTEIRDKKKKEYALFY
RLDVVPINDNGNSSIYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEIIIRSENITDNTKVIIVQLNETEIINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTKWNEMLQKVK
AQLKKIFNKSITFNSSSGGDLEITTHSFNCRGEFFYCNTSGLFNNSLLNSTNSTITLPCKIKQIVRMWQRVGQAMYAPPIAGNIT
CRSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKIVKIKPLGVAPTRARRRVVEREKRAVGLGAVLLGFLGAAGSTMG
AASITLTVQVRQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSN
KSYNEIWDNMTWIEWEREISNYTQQIYSLIEESQNQQEKNEQDLLALDKWASLWNWFDITKWLWYIKIFIMIVGGLIGLRIVFAV
LSIVNRVRQGYSPLSFQTLTHHQREPDRPERIEEGGEQDKDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVELLG
RSSLKGLRLGWEGLKYLWNLLLYWGQELKNSAINLLDTIAIAVANWTDRVIEVAQRACRAILNIPRRIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 32B

Con-G-2003 140CF (626 a.a.)
Nick name: 007

MRVKGIQRNWQHLWKWGTLILGLVIICSASNNLWVTVYYGVPVWEDADTTLFCASDAKAYSTERHNVWATHACVPTDPNPQEITL
ENVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNVTNNTNNTKKEIKNCSFNITTEIRDKKKKEYALFY
RLDVVPINDNGNSSIYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEIIIRSENITDNTKVIIVQLNETEIINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTKWNEMLQKVK
AQLKKIFNKSITFNSSSGGDLEITTHSFNCRGEFFYCNTSGLFNNSLLNSTNSTITLPCKIKQIVRMWQRVGQAMYAPPIAGNIT
CRSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKIVKIKPLGVAPTRARTLTVQVRQLLSGIVQQQSNLLRAIEAQQH
LLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSNKSYNEIWDNMTWIEWEREISNYTQQIYSLIEES
QNQQEKNEQDLLALDKWASLWNWFDITKWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site

Fig. 32C

CODON-OPTIMIZED Con-G-2003 140CF.seq
Nick name:007

TTCAGTCGACAGCCACCATGCCAGTGAAGGGAATCCAGAGAGAAATTGGCAGCAGCCTTTGGAAGTGGGCACACTCATCCTGCGCCT
TGTGATCATATGCTCTGCCTCCTCAAATAACCTTTGGGTCACAGTTTATTACGGCGGTGCCCGTTGGGAGGACGCAGACACAACTCTT
TTTTGTGCCAGCGACGCTAAGGCTTATTCAACAGAGAGGCATAAACGTTTGGGCTACACATGCGTGCCGACCGATCCTAATC
CCCAGGAAATCACTCTTGAGAATGTTACAGAGAATTTAATATGTGGAAGAACAACATGGTTGAACAGATGCATGAAGACATAAT
TTCTCTCTGGGATGAATCTCTGAAACCTTGCGTGAAGCTTACACCACTGTGCTTCAACATAACCACCGAGATACGCGATAAAAAGAAAG
AATAATAATAACCAACAATACAAAAAGAAATCAAAAAATTGTTCTTTCAACATAACCACCGAGATACGCGATAAAAAGAAAG
AATACGCCCTGTTCTACAGACTCGATGTGGTCCCAATTAATGACACCTATTCCCATTACTGTGCCCCGCTTATCAATTGTAACGT
GTCTACAAATCAAACAGGCCTGTCCTAAAGTCACATTTGACCCTATTCCCATTACTGTGCCCCGCTTATCAATTGTAACGT
AAATGCCGAGAACAAAAATTAACGGAACAGAGACCATGCAAGAAGTGCTCAAACAGTTCAATGGAATTAAACCAGTCG
TTTCTACTCAACTCGTACAGCTGAACGAGACCATTGAAATAAATTGTACGAGATATCCGCAGCTCACTGTAAGTGTCTAGAACAAAGT
AATCATCGTACAGCTGAACGAGACCATTGAAATAAATTGTACGAGATATCCGCAGCTCACTGTAAGTGTCTAGAACAAAGT
GGACAGGCTTTCTACGGCCACAGGAGACATTATCGGGAGAAATATTCAACAAATCTATTACAACGTCCGGCCTATCAGGGCGGCCCCC
TGCTTCAGAAGGTCAAAGCTCAGCTCAACTGTCGGGGAGAATTTTTTACTGTAACACGTCCGGCCTATCAGGGCGGCGATCTGGAGAT
AACAACTCCATTCATTCCTTCAACTCACTCTCCATGTAAGATCAAACAAATCGTCAGAATGTGGCAGCGAGTCGGTCGGCCCCTCCAA
ACCAGGAGGAGGAGGAGAACATGCCGAACTGCTCCAGTGAGGCAACTGCTGTATAAATATAAGATCGTAAAATCAAACCATTGGGTGTAGCG
TCGAGGCGCCCAGCAGCGAACTGACCGTGCAGGTTGCAGCTTACTGTATGGGGGAATCAAACAACTGCAAGCAAGAGTATTGGCAGTGGAGGTATCT
CAAGGACCAGCAGCGCAGCTTCTGGGAATTTGGGGTTGCAGCGAACAATATGACAATGGGAGCGCGCGAAATATCCAACCAATGGGAGT
AATAAGAGTTACAATGAAATCTGGGACAATATGACAATGGGAGCGCGCGAAATATCCAACCAATCTATT
CCCTCATTGAAGAGAGTCAGAACCAGCAGCAAGACCTCCTCGCCCTGATAAATGGGCATCTCTGTGGAACTG
GTTTGACATAACTAAATGGTTGTGGTAAAGATCTTACAA

Fig. 33A

CONSENSUS 01 AE-2003 (854 a.a.)

MRVKETQMNWPNLWKWGTLILGLIVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWKNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNVNNITNVSNIIGNITNEVRNCSFNMTTELRDKK
QKVHALFYKLDIVQIEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVV
STQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEV
LKQVTEKLKEHFNNKTIIFQPPSGGDLEITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIILPCKIKQIINMWQGAGQA
MYAPPISGRINCVSNITGILLTRDGGANNTNETFRPGGGNIKDNWRSELYKYKVVQIEPLGIAPTRAKRRVVEREKRAVGIGAMI
FGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIIC
TTAVPWNSTWSNRSFEEIWNNMTWIEWEREISNYTNQIYEILTESQNQQDRNEKDLLELDKWASLWNWFDITNWLWYIKIFIMIV
GGLIGLRIIFAVLSIVNRVRQGYSPLSFQTPTHHQREPDRPERIEEGGEQGRDRSVRLVSGFLALAWDDLRSLCLFSYHRLRDF
ILIAARTVELLGHSSLKGLRRGWEGLKYLGNLLLYWGQELKISAISLLDATALAVAGWTDRVIEVAQGAWRAILHIPRRIRQGLE
RALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted as 140CF.

Fig. 33B

Con-AE01-2003 140CF.pep (638 a.a.)
Nick name: 008

MRVKETQMNWPNLWKWGTLILGLIVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWKNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNVNNITNVSNIIGNITNEVRNCSFNMTTELRDKK
QKVHALFYKLDIVQIEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVV
STQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEV
LKQVTEKLKEHFNNKTIIFQPPSGGDLEITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIILPCKIKQIINMWQGAGQA
MYAPPISGRINCVSNITGILLTRDGGANNTNETFRPGGGNIKDNWRSELYKYKVVQIEPLGIAPTRAKTLTVQARQLLSGIVQQQ
SNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIICTTAVPWNSTWSNRSFEEIWNNMTWIEWEREISN
YTNQIYEILTESQNQQDRNEKDLLELDKWASLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 33C

CODON-OPTIMIZED Con-AE01-2003 140CF.seq (1945 nt.)

Nick name: 008

ttcagtcgacagccaccatgcgcgagtcaaggaagaaacacacaaatgaactggcctaatctgtggaagtgggggcaccctgatcctggcgttt
GGTCATTATTTGCTCTGCGAGCGACAAATCTCTGGGTTACTGTCTATTACGGAGTCCCCGTTGGAGAGATGCCGACACTACACTG
TTCTGCGCGCCTCAGATGCCAAAGCTCATGAAAGCTGAAGTGCATAATGTTTGGGCAACCCACGCCTGTTCCTACCGACCCAAACC
CCCAAGAAAATACACCTGGAAAACGTGACCGAGAACTTTAATATGTGGAAGAATAACATGGTTGAACAGAGATGCAAGAAGACGTAAT
CAGCCTGTGGGATCAAAGTCTGAAACCTTGCGTAAAACTGACTCCACTTTGCTAACACTTAATTGCACCACCGCGAACCTGACA
AACGTTAACAACAATCAACGTCTCCAACATCATCGGCAACACATAACGAACGAAGTGAGAAATTGCAGTTTCAATATGACTACAG
AGCTCCGGGACAAGAAACAGAGAGGTCCATGCTCTCTTTTTACAAACTCGACCATCGTCCAGATGCGAAGACAATAACAGCTACAGACT
TATAAAATTGTAATACATCCGTGATTAAACAAGCATGCCCCCAAAATAAGCTTCGATCTAATTCCTATCCTACTACTGTACTCCTGCC
GGCTATGCTATCTTGAAATGCAATGATAAGAACTTCAATGGGACCGGACCTTGTAAGAACGTGTCTAGTGTGCAATGCACTCACG
GCATTAAACCAGTGGTAAGCACTATCATCGTACATCTCAATAAATCAGTCAGACCCTCCAATAATACTAGAACTTCA
ATCACTATCGGCCCAGGAGTACTCAAAACAAGTGCACCCACTTCAACTGCCGCCGCGAATTTTTATTGCAATACCACTAAACTTTTCAACAAT
CAAAATGGAACGAAGTACTCAGAACTCACTATGAGACCATGGAGGGCTGCAATGGAACAATCATACTCCCATGCAAGATAAACATCATTAAACATGTGGC
TGGCGGGAGACCTCGAAATGAGACCTATGTATGCCAAGCTGGACCCCCAATATCCGACCAGGCGCGACTCGCGCTAGAATTTCGTCAGCAGG
ACGTGCTGGACAAGCTATGTGTATGCAAATAATACAAATGAAACATTCCGACCAGGCGCGGCAACATTAGGACACTGCGGTCCGAACTCTATAAG
AGACGGAGGAGCAAATAAATACAAATGAAACCTCTTGGAATAGCACGATCGAACCTTGGAATAGCACGATCGAACCTGGAATAGCAAGTTTGGGAATCAAGCA
TACAAAGTCGTACAGATGCAATCCAACCTCCTCCGCGAAAGATACCTGAAGGATCAGAGTTTTGAAGAGAGCCAAAATAATC
GCTCAGGCACGCGTGCTCGCAGTGAAGATACTGGAGCAACCGGAGTTTCCTTGGTCTCTCGGGGATGTTCTGGCAAAAATAAATGAGAGTGGG
AAAGGAAATTAGTAACTATACGAACCAGATATACGAAATCCTCACCGAAAATCAGCGACGAGCAGGATCGCAACATGACCGAACGCAACGCAGTAGAGACCT
CCTCGAGCTTGATAAGTGGGGCATCCCCTTTGGAACTGGTTCGACATCACAAATTGGCTCTCTGGTaaagatcttacaa

Fig. 34A

Wild-type subtype A Env

00KE MSA4076-A (Subtype A, 891 a.a),

MGAMGIQMNWQNLWRWGTMILGMLIICSVAEKSWVTVYYGVPVWRDAETTLFCASDAKAHDKEVHNVWATHACVPTDPNPQEMIL
ENVTEDFNMWKNSMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSDSNITSNSTKDSATLDMKSEIQNCSFNMTTELRDK
KQKVYSLFYRLDVVQINENSSDYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIKP
VVTTQLLLNGSLAEEEVMIRSENITENAKNIIVQFKEPVQIICIRPGNNTRKSVHIGPGQAFYATGDIIGDIRQAHCNVSRELWN
KTLQEVATQLRKHFRNNTKIIFTNSSGGDVEITTHSFNCGGEFFYCDTSGLFNSSWTASNDSMQEAHSTESNITLQCRIKQIINM
WQRAGQAMYAPPIPGIIRCESNITGLILTRDGGEGNNSTNETFRPVGGNMRDNWRSELYKYKVVKVEPLGVAPTKSRRRVVEREK
RAVGLGAVFIGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTVWGIKQLQARVLAVERYLRDQQLLGI
WGCSGKLICTTNVPWNSSWSNKSLDEIWENMTWMQWDKEVSNYTQMIYNLLEESQNQQEKNEQELLALDKWANLWNWFNISNWLW
YIKIFIMIVGGLIGLRIVFAVLSVINRVRQGYSPLSFQTHTPNPRGLDRPGRIEEGGEQDRDRSIRLVSGFLALAWDDLRSLCL
FSYHRLRDFILIAARTLELLGHNSLKGLRLGWEGLKYLWNLLAYWGRELKISAISLVDSIAIAVAGWTDRLIEIVQAIGRAILHI
PRRIRQGLERALI

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 34B

00KE_MSA4076-A 140CF.pep (647 a.a)

Nick name: 011

MGAMGIQMNWQNLWRWGTMILGMLIICSVAEKSWVTVYYGVPVWRDAETTLFCASDAKAHDKEVHNVWATHACVPTDPNPQEMIL
ENVTEDFNMWKNSMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSDSNITSNSTKDSATLDMKSEIQNCSFNMTTELRDK
KQKVYSLFYRLDVVQINENSSDYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIKP
VVTTQLLLNGSLAEEEVMIRSENITENAKNIIVQFKEPVQIICIRPGNNTRKSVHIGPGQAFYATGDIIGDIRQAHCNVSRELWN
KTLQEVATQLRKHFRNNTKIIFTNSSGGDVEITTHSFNCGGEFFYCDTSGLFNSSWTASNDSMQEAHSTESNITLQCRIKQIINM
WQRAGQAMYAPPIPGIIRCESNITGLILTRDGGEGNNSTNETFRPVGGNMRDNWRSELYKYKVVKVEPLGVAPTKSRTLTVQARQ
LLSGIVQQQSNLLRAIEAQQHLLKLTVWGIKQLQARVLAVERYLRDQQLIGIWGCSGKLICTTNVPWNSSWSNKSLDEIWENMTW
MQWDKEVSNYTQMIYNLLEESQNQQEKNEQELLALDKWANLWNWFNISNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

Fig. 34C

CODON-OPTIMIZED OOKE MSA4076-A 140CF.seq (1972 nt.)
Nick name: 011

```
ttcagtcgacagccaccATGGGGGCAATGGGAATCCAGATGAACTGGCAGAACCTTCTGGCGATGGGCACAATGATCCTGGGTAT
GCTCATCATCTGCTCTGTTGCAGAAAAGTCATGGGTAACAGTCTACTACGGCTAACAGTCCACAATGTTTGGGCTACCATGCCTAACC
TTCTGCGCCTCCGATGCCAAAGCACACGATAAAGAAGTCCACAATGTTTGGGCTACCATGCCGTGCCAACCGATCCTAACC
CACAAGAAATGATACTCGAAAACGTTACTGAAGACTTCAACATGTGGAAAAATTCTATGGTTGAACAGATGCACACCGACATAAT
ATCACTGTGGGATCAGTCTCTCAAACCCTGTGTCAAATTGACCCCCCTCTCGCGTTACACTGTTCCGACTCAAATATCACT
TCTAATTCAACGAGCAATAGTACGAAAAGACTCCGCAACCCTTGATATGAAAAGCGAAATACAGAACTGTTCATTTAATATGACCA
CCGAACTGAGAGAGTAAAAAGCAGAGAAGGTTTATTCTCTGTTCTATCGATTGGACGTGGTTCAGATTAACGAAAAATAGCAGCGATTA
CCTGCAGGATTTGCCATCCTGAAATGCAATCACACACGATAAGAAGTTTAATGGACAGGACCCTGCCCAAAGGTAACATTCACTACGCGCC
CCCACGGCATAAACCTGTTGTTACCACACAATGCTGTCTCAAAGAACCCGTCCAGATCATTGCATTCGCCCTGGTAACAACTCGC
CATCACTCAGTGCCAAAAATATTATAGTTCAGTTCAACCGGAGATATTATAGGCACATCAGAACAATTGCACATTGCAACGTCA
AAGTCAGTGCACATTGGGCCCGGCCAGCCTTTGCAGGAAGTTGCTACTCAGTTGCTACTACCCATTCATTTAACTGTGGCGGAGAATTCTTCTATTGCGATACCCTCTGGGCTC
GCCGGGAATTGTGGAACAAAACTTTGCAGGAAGTTGCTACTCAGTTGCTACTACCCATTCATTTAACTGTGGCGGAGAATTCTTCTATTGCGATACCCTCTGGGCTC
TAATTCATCAGGCGGTGACGTGGAGATCAACTACCCATTCATTTAACTGTGGCGGAGAATTCTTCTATTGCGATACCCTCTGGGCTC
TTTAATTCCTCATGACTGCTAGCAACGATTCAATGCAAGAAAGCACATTCCACAGAAAGTAATATCACACTGCCAGTTA
AACAAATCATCAATATGTGCAGCCGAGACGGTGGCGAGACGGTGGCGAGAAGGTTAATAATTCTACAAACGAGACTTTCAGACCCGTAGGAGGCAATATGCGA
CACTGGCCCTCATTCTGACCCGAGACGGTGGCGAGACGGTGGCGAGAAGGTTAATAATTCTACAAACGAGACTTTCAGACCCGTAGGAGGCAATATGCGA
GACAATTGGCGATCCGAACTGTATAAAATATAAAGTGGTGAAGGTAGAACCTCTTGGAGTGGCACCCAACATCACGAACAACCCTGA
CTGTGCAGGCACGCCAACTTCTGAGCGGAATCAAACAATTGCAGGCAAGAGTGCTGGCAGTGATACTTGAGAGACCAACAACAACTCCTGGGA
TAAACTTACGGTGTGGGAATCAAACAATTGCAGGCAAGAGTGCTGGCAGTGATACTTGAGAGACCAACAACAACTCCTGGGA
ATCTGGGATGTTCCGGTAAGTTGATTTGCACGACAAGAAGTTGCCAACTATACACAGATGATCTACAACCTCCTCGAAGAATCTCAGAA
GGGAAAAATATGACAATGGATGCAGTGGGACAAGGAAGTTAGCAACTATACACAGATGATCTACAACCTCCTCGAAGAATCTCAGAA
TCAACAGGAAAAAAACGAACAAGAACCTGCTCGCCCTCGATAAGTGGGCTAACCTCTGGAACTGGTTTAATATTTCAAACTGGTTG
TGGtaaagatcttacaa
```

Fig. 35A

Wild-type subtype B
QH0515.1g gp160 (861a.a)
MRVKEIRRNCQRLRRWGTMLLGMLMICSATEQLWVTVYYGVPVWKEATTLFCASDAKAYVTEKHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWEQSLKPCVKLTPLCVTLNCTDKLRNDTSGTNSSSWEKVQKGEIKNCSFNITTGIRGRVQ
EYSLFYKLDVIPIDSRNNSNNSTEFSSYRLISCNTSVITQACPKISFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCT
HGIKPVVSTQLLLNGSLAEEEVIRSENFTNNVKSIIVQLNKSVVINCTRPNNNTRKSIHIGAGKALYTGEIIGDIRQAHCNLSR
AQWNNTLKQIVIKLREQFGNKTIVENQSSGGDVEIVMHSFNCGGEFFYCNSTQLFNSTWNGNDTWNDTWKDTTNDNITLPCRIKQ
IVNMWQKVGKAMYAPPIRGQIRCSSKITGLLILTRDGGTNGTNETETFRPGGGNMKDNWRSELYKYKVVKIEPLGIAPTKAKRRV
QREKRAVGTIGAMFLGFLGAAGSTMGAASLTLTVQARLLLSGIVQQQNNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLRDQ
QLLGIWGCSGRLICTTNVPWNTSWSNRSLNYIWDNMTWMQWDREINNYTDYIYTLLEDAQNQQEKNEQELLELDKWASLWNWFDI
TNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSLQTHLPARRGPDRPEGIGEEGGERDRDRSVRIVHGFLALVWEDL
RSLCLFSYHRLRDLLLIVARTVEILGQRGWEALKYWWNLLLYWSLELKNSAVSLVDTIAIAVAEGTDRIIEIARRIFRAFLHIPT
RIRQGLERALL
*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design

Fig. 35B

QH0515.1g 140CF (651a.a)
Nick name: 012
MRVKEIRRNCQRLRRWGTMLLGMLMICSATEQLWVTVYYGVPVWKEATTLFCASDAKAYVTEKHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWEQSLKPCVKLTPLCVTLNCTDKLRNDTSGTNSSSWEKVQKGEIKNCSFNITTGIRGRVQ
EYSLFYKLDVIPIDSRNNSNNSTEFSSYRLISCNTSVITQACPKISFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCT
HGIKPVVSTQLLLNGSLAEEEVIRSENFTNNVKSIIVQLNKSVVINCTRPNNNTRKSIHIGAGKALYTGEIIGDIRQAHCNLSR
AQWNNTLKQIVIKLREQFGNKTIVENQSSGGDVEIVMHSFNCGGEFFYCNSTQLFNSTWNGNDTWNDTWKDTTNDNITLPCRIKQ
IVNMWQKVGKAMYAPPIRGQIRCSSKITGLLILTRDGGTNGTNETETFRPGGGNMKDNWRSELYKYKVVKIEPLGIAPTKAKTLTV
QARLLLSGIVQQQNNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLRDQQLLGIWGCSGRLICTTNVPWNTSWSNRSLNYIWD
NMTWMQWDREINNYTDYIYTLLEDAQNQQEKNEQELLELDKWASLWNWFDITNWLW*
*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 35C

CODON-OPTIMIZED QH0515.1g 140CF.seq (1984 nt.)
Nick name:012

ttcagtcgacagcagccaccatgagcagctaaaagaagaaatcagacgccaactgtcagaggttgaggagatgggaacgatgctcctgggcat
GCTGATGATTGCGTCCGACGCAAAAGCCTACGTAACAGAAAAGCACAACGTGTGGGCCACACATGCATGCCAACAGATCCAAATC
TTTGCGCGTCCGACGCAAAAGCCTACGTAACAGAAAAGCACAACGTGTGGGCCACACATGCATGCCAACAGATCCAAATC
CTCAGGAAGTCGTTCTGGAACAATCCTTGAAACCTTGTGTCAAACTGACCCCACTTTGCGTAACACTTAACTGTACTGATAAGCTTCGCAAT
CTCACTGTGGGAACAATCCTTGAAACCTTGTGTCAAACTGACCCCACTTTGCGTAACACTTAACTGTACTGATAAGCTTCGCAAT
GATACGTCCGGAACAAAATTCAAGCAGCTGGAAAAAGTGCAAAATCAAAAATTGTTCATTTAACATCACTACCGGTA
TCAGAGGGCGGGTACAGGAATATTCTCTTTTCTACAAACTCGACGTCATCCCAATCCCACAACCAAGCGTGCCCTAAAAATCTCTTTGAGCCCATTCCT
AGAATTTAGTAGTTATCGCCTTATAAGCTGCAACACCAGCTGATTACGACAAGAAATTTAACGACACCAAGCGTGCCCTAAAAATCTCTTTGAGCCCATTCCT
ATTCACTACTGCGACCAGCCGCTTCGCCATCCTCAAATGTAACGACAAGAAATTTAACGACACCAAGCGTGCCCTAAAAATCTCTTTGAGCCCATTCCT
CCACCGTTGCTCAATGCACTCATGGAATCAAGCCCGTCGTTCTTCTCAGCTTAATAAATCCGTCGTTATTAATTGTACAAGACCC
GATTCGCTCCGAAAAATTTTACAAACAACGTCAAGTCAATCATCGTCCAGCTTAATAAATCCGTCGTTATTAATTGTACAAGACCC
AACAATAACACCAGAAAAATCCATTCACATAGGGCCGGAAAGCTCTGTATACCGGGGAAATTATTGGAGACATCAGACAAGCAC
ACTGTAACTTGAGTCCGCGCGCCCAGTGGAACAACACATTGAAACAGATCGTAATGCACTCTTTAATTGTGTGGGGTGAATTTTTTTACTGCAATTCT
CGTGTTTAATCAGAGCTCCGGCCGGTGATGTCGAAACGTGAAATCGTAATGCACTCTTTAATTGTGTGGGGTGAATTTTTTTACTGCAATTCT
ACACAATTGTTAACAGCACCTGGAACGGCAAATCGTAAATATGTGGCAAGCACGGGAGCGGAGGCAGGGGACCTTCCGACCAGGAGGC
GGCAACATGAAGGATAACTGAGAAGTGAACTTTACAAGTATAAAGTGGTCAAGATTGGTCAACAACAGAGAACGAACCTTCCGACCAGGAGGC
CTAAAAACACTCACCGTGCTGCAGGCTAGATTGCTGCTTTCAGGGATTAAAACAGTTGCAGGCCGCCTAAAAGTGTCCCTTGAAGTGGTATCTTAGAGATCAG
ACAACACTTGCTGCTGGGTATCTGGGGGTGTTGACAGTGTGGGGAATTAAACAGTTGCAGGCCGCCTAAAAGTGTCCCTTGAAGTGGTATCTTAGAGATCAG
CAGCTTTGGTGCTTGGGTATCTGGGGGTGTTCAGGGCGTAGAGAATTAATAACTACACCGACTACATCTACACACTTCTGGA
TTAATTATATTTGGGACAATATGACAATATGACATGCAATGGATAGAGAAAATTAATAACTACACCGACTACATCTACACACTTCTGGA
GGACGCCCAGAATCAGCAGGAGAAGAAGAGAAGAACGAGGAACTCCCTGAATTGGATAAGTGGGCATCACTGTGGCATTCACTGTGGCATTCACTGTGGAATTGGTTCGATATA
ACTAATTGGCTTTGGtaaagatcttacaa

Fig. 36A

Wild-type subtype C
DU123.6 gp160(854 a.a)

MRVKGIQRNWPQWWIWGILGFWMIIICRVVGNLWVTVYYGVPVWTEAKTTLFCASDAKAYEREVHNVWATHACVPTDPNPQEIVL
GNVTENFNMWKNDMVDQMHEDIISIWDQSLKPCVKLTPLCVTLNCTDVKVNATSNGTTYNNSIDSMNGEIKNCSFNITTEIRDK
KQKVYALFYRPDVVPLNENSSSYILNCNTSTTTQACPKVSFDPIPIHYCAPAGYAILKCNNKTENGTGPCHNVSTVQCTHGIKP
VVSTQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNESIEIVCTRPNNNTRKSIRIGPGQTVYATNDIIGDIRQAHCNISKTKWN
TTLEKVKEKLKEHFPSKAITFQPHSGGDLEVTTHSENCRGEFFYCDTTKLFNESNLNTTNTTTLTLPCRIKQIVNMWQGVGRAMY
APPVEGNITCNSSITGLLLVRDGGNTSNTPEIFRPGGGNMKDNWRSELYKYKVVEIKPLGVAPTKAKRRVVEREKRAVGIGAVL
FGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVWGIKQLQARVLAIERYLKDQQLLGLWGCSGKLIC
PTTVPWNSSWSNKSQTDIWDNMTWMQWDREISNYTGTIYKLLEESQNQQEKNEKDLLALDSWKNLWSWFDITNWLWYIKIFIMIV
GGLIGLRIIFGVLSIVKRVRQGYSPLSFQTLTPNPRGLDRLGRIEEEGGEQDKDRSIRLVNGFLALAWDDLRSLCLFSYHRLRDF
ILVAARAVELLGRSSLRGLQRGWEALKYLGNLVQYGGLELKRRAISLFDTIAIAVAEGTDRILEVILRIIRAIRNIPTRIRQGFE
AALL

Fig. 36B

DU123.6 140CF (638 a.a)
Nick name: 013

MRVKGIQRNWPQWWIWGILGFWMIIICRVVGNLWVTVYYGVPVWTEAKTTLFCASDAKAYEREVHNVWATHACVPTDPNPQEIVL
GNVTENFNMWKNDMVDQMHEDIISIWDQSLKPCVKLTPLCVTLNCTDVKVNATSNGTTYNNSIDSMNGEIKNCSFNITTEIRDK
KQKVYALFYRPDVVPLNENSSSYILNCNTSTTTQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCHNVSTVQCTHGIKP
VVSTQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNESIEIVCTRPNNNTRKSIRIGPGQTVYATNDIIGDIRQAHCNISKTKWN
TTLEKVKEKLKEHFPSKAITFQPHSGGDLEVTTHSENCRGEFFYCDTTKLFNESNLNTTNTTTLTLPCRIKQIVNMWQGVGRAMY
APPVEGNITCNSSITGLLLVRDGGNTSNTPEIFRPGGGNMKDNWRSELYKYKVVEIKPLGVAPTKAKTLTVQARQLLSGIVQQQ
**SNLLRAIEAQQHMLQLTVWGIKQLQARVLAIERYLKDQQLLGLWGCSGKLICPTTVPWNSSWSNKSQTDIWDNMTWMQWDREISN
YTGTIYKLLEESQNQQEKNEKDLLALDSWKNLWSWFDITNWLW***

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 36C

CODON-OPTIMIZED DU123.6 140CF.seq (1945 nt.)

Nick name: 013

ttcagtcgacagccaccATGCGCGTAAAGGGGATTCAAAGAAATTGGCCGCAATGGTGATTTGGGGCTTTTGGAT
GATAATTATATGCCGCGTTGTCGGAAATTTGTGGGTGACTGTGTACTACGGGGGTGCCCGTGTGACTGAGGCAAGACCACCCTG
TTCTGTGCTAGCGATGCCAAAGCCTATGAACGCGAAGTGCACAATGTTTGGGCTACTCATGCCTGTCCCACCGACCCAAACC
CTCAGGAAATAGTGCTCGGCAATGTAACGGAAAACTTCAACATGTGGAAAAAATGATATGGTGGATCAGATGCACGAAGACATTAT
CTCAATCTGGGACCAAAGCCTGAAACCCTGTTAAACTGACTCCTCTCGCGTCACTCTCAATTGCACAGATGTCAAAGTGAAT
GCCACCTCAAACGTACGACAACTTACAACAATTCTATTGACTCATGAACGGCGAAATCAAAAAATTGTTCCTTTAACATCACCA
CCGAGATACGCGACAAAAAGCAGAAGGTCTATGCCCTTTTTTACCGCCCTTTTTTTACCGCCCCGGACGTAGTCCCACTCAACGAGAATTCCAGCTCATA
CATCCTCATCAACTGCAATACCAACAACCTACCACAACAAGCATGCCGAAAGTTAGCTTGATCCAAATCCTATACATTACTGCGCC
CCCGCCGGCTACGTACGTGGTGTGTCAACCCAGCTGCTCACTTGCACCTTAATGAATCAATAGAAATCGTGTTACTCGGGCCCAACAATAATACTAGA
CTCATGGCATCAAGCCCGTGGTGTGTCAACCCAGCTGCTCACTTGCACCTTAATGAATCAATAGAAATCGTGTACTCGGGCCCAACAATAATACTAGA
TCTTACTACAGTGGAATCCGACCTGGCCAGACAGTTACGCAACTCATGAATCATCATGGGGGACATCCGACAGGCCCATTGCAACATTT
AAAAGCATTCGCATCGGACCTGGCCAGACAGTTACGCAACTAAGAAAAGTAAAGGTAAAGGTAAAGGTAAAGCATTTCCCTCTCAAGGCGATCACGTTTCAACC
CTAAAACCAAGTGGCGGAGACTTGGAAGTCACAACACCACCACAATACAACCACCACGCACCCCTCGACCCCTGTCGATCACGTTTCAACC
AATGAATCAAATCTCAACACCACAAATACAACCACACGCCCCCGTGTCGATCACGTTTCAACC
AGGCAATACTTCTAATTCAACTCATTTTTAGGCCTGCGGGTGTAACAGCAGCATCGGCTGCTTTCTTGTTCGAGACGG
TACAAAGTTGTTGAAATTAAGCCCGGGAGTCGCTCCAACAAAGCTAAAACACTCAAAAGCTAAAAACGCCGAGTCGCTCAGAACTGTACAAA
GCTTCAAGCCCCGCGTCCTGCTTCCTGCTTCCTTAGAACGCTATCTTAAAGCAACGACCAGCTTCTTGGCCTTCTCGGGGATTAAAACA
ATAGGGAAATTTTCTAATTATATACTGGCACAATCTACAAACTCTTGGAGTAATAAATCACAGACCGATATTTTGGGACAACATGACCTGATGCAATGGG
CCTCGCCCCTGGACTCCCTGGAAGAATCTTTGGAGCTGGTTCGACATAAACTAATTGGCTGTGTGGtaaagatcttacaa

Fig. 37A

Wild-type subtype CRF01_AE
97CNGX2F-AE (854 a.a.)

MRVKETQMNWPNLMKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWRNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANWTNSNNTTNGPNKIGNITDEVKNCTFNMTTELKDKK
QKVHALFYKLDIVQINSSEYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVVS
TQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSIITMGPGQVFYRTGDIIGDIRKAYCEINGIKWNEVL
VQVTGKLKEHFNKTIIFQPPSGGDLEIITHHFSCRGEFFYCNTTKLFNNTCIGNTSMEGCNNTIILPCKIKQIINMWQGVGQAMY
APPISGRINCVSNITGILLTRDGGADNNTTNETFRPGGGNIKDNWRSELYKYKVVEIEPLGIAPTRAKRRVVEREKRAVGIGAMI
FGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIIC
TTAVPWNSSWSNKSFEEIWDNMTWIEWEREISNYTSQIYEILTESQNQQDRNEKDLLELDKWASLWNWFDITNWLWYIKIFIIIV
GSLIGLRIIFAVLSIVNRVRQGYSPLSFQTPTHHQREPDRPEEIGEGGGEQSKDRSVRLVSGFLALAWDDLRSLCLFSYHLLRDF
ILIAARTVELLGHSSLKGLRRGWEGLKYLGNLLLYWGQEIKISAISLLNATAIAVAGWTDRVIEVAQRAWRALLHIPRRIRQGLE
RALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 37B

97CNGX2F-AE 140CF.pep (629 a.a.)
Nick name: 018

MRVKETQMNWPNLMKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWRNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANWTNSNNTTNGPNKIGNITDEVKNCTFNMTTELKDKK
QKVHALFYKLDIVQINSSEYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVVS
TQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSIITMGPGQVFYRTGDIIGDIRKAYCEINGIKWNEVL
VQVTGKLKEHFNKTIIFQPPSGGDLEIITHHFSCRGEFFYCNTTKLFNNTCIGNTSMEGCNNTIILPCKIKQIINMWQGVGQAMY
APPISGRINCVSNITGILLTRDGGADNNTTNETFRPGGGNIKDNWRSELYKYKVVEIEPLGIAPTRARTLTVQARQLLSGIVQQQ
SNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIICTTAVPWNSSWSNKSFEEIWDNMTWIEWEREISN
YTSQIYEILTESQNQQDRNEKDLLELDKWASLWNW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 37C

CODON-OPTIMIZED 97CNGX2F-AE 140CF.seq (1921 nt.)

Nick name: 018

ttcagtcgacagccaccATGCCGAGTAAAAGAGACACAAATGAATTGGCCCAATTTGTGGAAGTGGGGAACATTGATCCTGGGACT
GGTGATAAATCTGTAGTGCATCCGACAATCTCTCGGGTGACCGTTACTATGGTGTACCAGTTTGGAGAGACGCTGATACCACCCTC
TTCTGTGCAAGCGACGCCAAAGCCCACGAAACTGAAGTCCATAATGTATGGGCCACCCACGCGTGCGTACCAACCGACCCTAATC
CCCAAGAGATCCACCTTGAGAATGTAACTGGAGAATTTAACATGTGGAGAAATAACATGGTGGAACAAATGCAGGAAGACGTTAT
TTCCTTGTGTGGGGACCAGAGCCTTAAACCTTGTGTCAAATTGACTCCCCTGTGTGTGACTCTCAATTGTACAAACGCAAATTGGACC
AACAGCAACAACAACTACCAACGGCCCTAACAAAATTGGCAATATTACTGATGAAGTCAAGAACTGCACTTTTAACATGACAACAG
AACTGAAGGATAAGAAACAGAAGAAAGTCCATGCTCTCTATAAGCTCTGTTCTAAAGATAAGCTTCAGCAGGCCCTGTGTTCCAAAGAAAACGTTCCTCGATCCCTATTCACTACTGCACACCAGCCGGT
AAACTGCAATACTTCCGTTATCAAACAGGCCGTTATCAAACAGGCCGTTATCAAACAGGCCGTTATCAAACAGG
TACGTCTATCCTGAAATGCAACGATAAGAATTTTAACGGCACAGGCTCCCTGGCCGAAGAAGAGATCATTTAGAAGTGAGAACCTGACGAA
TCAAGCCTGTAGTATCAACACAACTGCTCCTTCAATAAAAATCTGTAGAAAATCAACTGTACCCGACCCTCAAACAACACTCGAACAAGTATA
CAACGCCAAGACTATAATAGTGCACCTCAATAAATCTGTAGAAAATCAACTGTACCCGACCGATATCAGAAAGGCATATTGCGAGATCAATGGCATCA
ACAATGGGAACCCTGGCCAAGTTTTTTACCGGACGGCGACATATAGGCGACATATAGGAACTCAAAGAACATTTAATAAGAACCATAATATTCCAGTCGGTGGGGGG
CGACCCTCGAGATTATCACCCATCCATTTCTTGTAGAGGCGAATTTTTTTACTGCCCTGTAAGATCAAATATCAAATATCAACGGCCATTATCAACATGTGGCCAGGGAG
TAGGTCAGGCAATGTACGCACCACCACTAACGAGACATTTAGACCTGGAGGCGGCAATAAGGATAATTGGAGAAGTGAGCTGTATAAA
AGGCGCAGACAACAATACCACTAACGAGACATTTAGACCTGGAGGCGGCAATAAGGATAATTGGAGAAGTGAGCTGTATAAA
TACAAAGTCGTAGAGATCTATGGAAGGATGTAATATAACTGCCCTGTAAGATCAAATATCAAATATCAACGGCCATTATCAACATGTGGCCAGGGAG
GCATAGTCCAACGAGAGTGCTCGCGCGTGAACGCTATTTGAAGATAATAAAAGCTTTGAAGAAATCTGGGACAATATGACATGGATTGAGTGGG
ATTGCAAGAAGAAGAGGTTCAAAGCTATACAAGACCAAATTACGAATAGAAAATACTGACAGAAAGTCAAAACCAGCAGGACAGGGAATGAGAAAGACCT
TGTACAACAGCGGTGCCTTGAAGCTATACAAGACCAAATTACGAATAGAAAATACTGACAGAAAGTCAAAACCAGCAGGACAGGGAATGAGAAAGACCT
AGAGAGAGATTTCAAACTATACAAGCCAAATTACGAATAAGAAATACTGACAGAAAGTCAAAACCAGCAGGACAGAGAAATGAGAAAGACCT
GCTCGAACTGGATAAGTGGGCCCTCTTTGTGGGAACTGGtaaagatcttacaa

Fig. 38A

Wild-type DRCBL-G (854 a.a.)

MRVKGIQRNWQHLWNWGILILGLVIICSAEKLWVTVYYGVPVWEDANAPLFCASDAKAHSTESHNIWATHACVPTDPSPQEINMR
NVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTEINNNSTRNITEEYRMTNCSFNMTTELRDKKAEYALFYR
TDVVPINEMNNENNGTNSTWYRLTNCNVSTIKQACPKVTFEPIPIHYCAPAGFAILKCVDKKFNGTGTCNNVSTVQCTHGIKPVV
STQLLLNGSLAEKDIIISSENISDNAKVIIVHLNRSVEINCTRPNNNTRRSVAIGPGQAFYTTGEVIGDIRKAHCNVSWTKWNET
LRDVQAKLQEYFINKSIEFNSSSGGDLEITTHSFNCGGEFFYCNTSGLFNNSILKSNISENNDTITLNCKIKQIVRMWQRVGQAM
YAPPIAGNITCRSNITGLILTRDGGDNNSTSEIFRPGGGDMKNNWRSELYKYKTVKIKSLGIAPTRARRVVEREKRAVGVGAIF
LGFLGTAGSTMGAASITLTVQVRQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLRARVLALERYLKDQQLLGIWGCSGKLIC
TTNVPWNTSWSNKSYNEIWENMTWIEWEREIDNYTYHIYSLIEQSQIQQEKNEQDLLALDQWASLWSFSISNWLWYIRIFVMIV
GGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLLHQREPDRPAGIEEGGGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDF
ILIAARTVELLGRNSLKGLRLGWEALKYLWNLLLYWARELKNSAINLLDTIAIAVANWTDRVIEVAQRAGRAVLNIPRRIRQGLE
RALI

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 38B

DRCBL-G 140CF.pep (630 a.a.)
Nick name: 017

MRVKGIQRNWQHLWNWGILILGLVIICSAEKLWVTVYYGVPVWEDANAPLFCASDAKAHSTESHNIWATHACVPTDPSPQEINMR
NVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTEINNNSTRNITEEYRMTNCSFNMTTELRDKKAEYALFYR
TDVVPINEMNNENNGTNSTWYRLTNCNVSTIKQACPKVTFEPIPIHYCAPAGFAILKCVDKKFNGTGTCNNVSTVQCTHGIKPVV
STQLLLNGSLAEKDIIISSENISDNAKVIIVHLNRSVEINCTRPNNNTRRSVAIGPGQAFYTTGEVIGDIRKAHCNVSWTKWNET
LRDVQAKLQEYFINKSIEFNSSSGGDLEITTHSFNCGGEFFYCNTSGLFNNSILKSNISENNDTITLNCKIKQIVRMWQRVGQAM
YAPPIAGNITCRSNITGLILTRDGGDNNSTSEIFRPGGGDMKNNWRSELYKYKTVKIKSLGIAPTRARTLTVQVRQLLSGIVQQQ
SNLLRAIEAQQHLLQLTVWGIKQLRARVLALERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSNKSYNEIWENMTWIEWEREIDN
YTYHIYSLIEQSQIQQEKNEQDLLALDQWASLWSW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 38C

CODON-OPTIMIZED DRCBL-G 140CF.seq (1921 nt.)
Nick name: 017

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ttcagtcgacagcaccaccATGAGAGAGTTAAAGGAATCCAACGCAATTGGCAACACCTTTGGAACTGGGCCATATTGATTCTTGGACT
GGTGATAATTTGTAGCGCTGAAAAACTCTGGGTAACTGTCTATTACGGCGTGCCTGCCTGTCTGGGAGGATGCCAACGCCCCCTGTTC
TGCGCAAGTGATGCAAAGGCTCACAGCACTGAATCTCACAACATTTGGGCCACCGCCTGTGTGCCAACCGACCCTAGTCCTC
AGGAGATCAACATGAACATGAAAACGTTACCGAAACATTTTAATATGTGGAAGAATAATATGGTGAGCAAATGCACGAAGACATAATTTC
ACTCTGGGACGAGTCTCTGAAACCATGTGTGAAACTTACCCCCCGTGCGTCGTCACCCTGAACTGTACCGAAATCAACAATAACTCA
ACGAGAAATATCACAGAAGAATACCGAATGACTAACCGAATGTGTACCAATCAACGATGGTGTACCAATCAACGAGAGATGAACAATGAAACAATGAAAACAATGAAAAGAGAGGCTGAAT
ACGCACTTTTCTACCGACAGTGTTGTACCAATCAAGCAGGCCTGCCCTAAAGTCACATTCGAACCAATACCAATTCACTACTGCGCACCCGCC
GACAAACTGTAACGTTAGCACGTTAGCACAATCAAGCAGGCCTGATAAGAAGTTAACGAACTGGAACCTGCAATAAGTCACATTGTATC
GGATTCGCTATTCTTAAGTGCGTGATAAGAAGTTAACGAACTGGAACCTGCAATAAGTCACATTGTATCTACAGTACAATGCACGCATG
GAATTAAGCCTGCTGTCGTTCAACCCAGTTGCTGCTGAATGGATCATCGTCCACCTCAGTGGGGGAAGTTATCGGCAGAAATAAACTGCACTCGGCCTAATAAACTGCACTCGGCCTAATAACACATATC
TGATAATGCAAAGTCAAAGGTCATCATCGTCCACCTCAGTGGGGGAAGTTATCGGCGACATACGGAAAGCCCACTGCAACGTTAGCTGGA
GTCGCAATCGGCCCAGGACAAGCTTTTTACACTACCGGGGAAGTTATCGGCGACATACGGAAAGCCCACTGCAACGTTAGCTGGA
CCAAGTGGAATGAAACACTGCGCGACTTACAACTGCGCGATGTTCAAGCCAAACTTCAAGAAATCAATTCTTTTGTAATACCTCCGTCTCTTCAACAAC
TGGCGGGCGACCTGAGATTACAACTCACTCCTTTAACTGCGCGGCGCCAATCACACTGAATTGCAAGATCAAGCAGATTGTTAGGATGTGGCAAC
TCTATCCCTCAAAAGTAACACATTTCTGAAAATAATGACACAACCAGGCGGAGCCGGAAATATAACGTGTCGATCAATATCACTGGCCTCATCCTTACTAGAGA
GAGTCGGACAAGCTATGTACGCCCCACCCATGCAACCTGGCCATTGCTCCGCGCCGATATTCAGACCAGGCGGAGGCCCGGGCCCCACTCGGGCCGAGAGTCCAGAGCTCTACAAG
TGGCGGGAGAGACAATAATAGCACCAGGGCCGATATTCAGACCAGGCGGAGGCCCGGGCCCACTCGGGCCGAGAGTCCAGAGCTCTACAAG
TACAAAACAGTCAAAATTAAAGCCTGGCATTGCTCCGCGCCGATATTCAGACCAGGCGGAGGCCCGGGCCCACTCGGGCCGAGAGTCCAGAGCTCTACAAG
GAATCGTCCAACAACAGTCCAACTTGCTGCGCGCTATAGAGGCTCAACAACAACTCCTTCAACTGACTGTCCAACTGACTGTGTGGGGTATCAAACA
ATTGAGAGCAAGAGTGCTGGCGCTGAACGGTATCTTAAGGACCAACAACAACTCCTCGGGCCATATGGGAAAACATGACATGGGGGTGTTCCGGCAAACTGATC
AAAGGGAAATTGACAATTATACATATACCATATAATCTCTCATCGAACAATCTCAGATACAACAACAGAGAAAAAGAATGAACAAGATTT
GTTGGCTCTTGACCAATGGGGCTTCTTTGTTGTGGAGTTGGTGGtaaagatcttacaa
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2003 Centralized HIV-1 Envelope Proteins and the Codon-Optimized Gene sequences

Fig. 39A

2003 Cons Env

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MRVMGIQRNCQHLWRWGILIFGMLIICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVLENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTTNNEEIKNCSFNITTEIRDKKKKVYALFYKLDVVPIDDNNSYRLI
NCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIRSENITNNAKTIIV
QLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLQQVAKKLREHFNKTIIFNPSSGGDLEITHSFNCGGE
FFYCNTSELFNSTWNGTNNTITLPCRIKQIINMWQGVGQAMYAPPIEGKIRCTSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYK
VVKIEPLGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQAR
VLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMEWDKEINNYTDIIYSLIEESQNQQEKNEQELLALDKWASLWN
WFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDRPEGIEEGGGEQDRDRSIRLVNGFLALAWDDLRSL
CLFSYHRLRDLILIAARTVELLGRRGWEALKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRVCRAILNIPRRIRQGFERAL
L$
```

Fig. 40A

2003 M. Group.AnC. Env

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MRVMGIQRNCQHLWRWGILIFGMLMICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVLENVTENE
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNSTNMGEIKNCSFNITTEIRDKKQKVYALFYRLDVVPINDNNSYRLJ
NCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIRSENITDNAKTII\
QLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISGAEWNKTLQQVAAKIREHFNNKTIIFKPSSGGDLEITTHSFNCGG
EFFYCNTSGLFNSTWNGTNETITLPCRIKQIVNMWQRVGQAMYAPPIAGNITCKSNITGLLLTRDGGTNNTETFRPGGGDMRDNWRSELYKY
KVVKIEPLGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQA
RVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMQWEREISNYTDIIYSLIEESQNQQEKNEQDLLALDKWASLW
NWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDRPGGIEEGEGGEQDRDRSIRLVSGFLALAWDDLRS
LCLFSYHRLRDFILIAARTVELLGRRGWEALKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRACRAILHIPRRIRQGFERA
LL$
```

Fig. 40B

2003 M. Group.anc Env.seq.opt

ATGCGCGTGATGGGCATCCAGCGCCAACTGCCAGCCACCTGTGGCGCTGGGCATCCTGATCTTCGGCATGCTGATGATCTGCTCCGCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAACACCACCCTGTTCTGCGCCTCCGACGCGCCAAGGCCTACGACA
CCGAGGTGCACAACGTGTGGGCCCACCACGCCTGCGTGCCCACCGACATCATCTCCCTGTGGGACCAGTCCCTGCGTGCGTGAAGCTGACCCC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAACTGCTCCTTCAACATCACCACCA
CCTGTGCGTGACCCTGACCTGCACTGCAAGCACGTGAACGCCACCAGATCAAGAACTGGGCGAGATCAACAACTCCACCGCTTCGCCAT
CCGAGATCCGCGACAAGAACGCAGAAGGTGTACGGCCCTGCCCCAAGGTGTCCTTGACGGTGGTGCCCATCAACTACTGCGCCACCAGTTCGCCAT
AACTGCAACACCTTCGACATCACCGAGGAAGTTCAACGGCACTGCCGCCAGCCTGCACCACCGCATCGCCCACGCATCAAGCCCGTGGTGT
CCTGAAGTGCAACGCCACGAACGAAGTTCAACGGCCTCCCTGGCCGAGGAGATCATCATCCGCCGAGTCCAGCAGCTGGCCGCCAAGC
CAGCTGAACGAGTCCGTGGAGATCAACTGCGCCAGCCCACTGCAACATCACCAACAACATCTCCGGCGCGGCACCAACGAGATCATCAAGCAGAT
CACCGGCGACATCATCGGCCGACAAGAACATCTTCAAGCCCTCCTGTTCAACTCCAACTGGAACGAGACCATCACCTGCAACATCACCGGCCTGCTGC
TGCGCGAGCACTTCAACAACAAGACCATCATTTCAAGCCCTCCTGTTCAACTCCAACTGGAACGAGACCATCACCTGCAACATCACCGGCCTGCTGC
GAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACTCCAACTGGAACGAGACCATCACCTGCAACATCACCGGCCTGCTGC
CGTGAACATGTGGCAGCGCGTGGGGCCACCAACACCACCGAGACCTTCCGCCCCGGCGGCGGCACCAACCTGGCGCTGTACAAGTAC
TGACCCGCCGACAAGCGGCCACCAACCAGACCTTCCGCCCCGGCGGCGGCACCAACCTGGCGCTGTACAAGTAC
AAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCACCAAGGCCAAGCGGCGGCGAGAAGCGCCCCGCATCGGCGC
CGTGTTCCTGGGCTTCCTGGGCCGCGGCCTCCACCATGGGCGCCAGCAGCACCTGCACTGCGCAGCGTGTCCGGCI
TCGTGCAGCAGTCCAACCTGCGTGCGCGAATGAGGACCAGCAGCTGCTGGGCATCTGGGGCATCTGCACCACCAACGTGCC
CGCCGTGCTGCTGGAGCGCTACCTGAAGGACGCCAGCTGCTGGGCATCTGGGGCATCTGCACCACCAACGTGCC
CTGGAACTCCTCCTGGTCCAACAAGTCCCAGAACGAGATCTGGGACAACATGACCTGGATGCAGTGGGAGCGCGAGATCTCCAACTACACCG
ACATCATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAAGAGAACGAGCAGGAACTGCTGGAACTGGATCGGCCTGCTGTTCGCCGT
AACTGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGGCCTGCGGATCGTTCCGCCGT
GCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCTGTGTCCTTCCAGACCCTGTGTCCCGCCGACCTGCCGCGCGGCGCGCGCTGGGGCCTCC
GCATCGAGGAGGAGGGCGGCGAGCAGGACCGCGGCAGGAGCGGCGGCTGGGGACGAGCTGCTGGAGCGCCTGGAGGCCCT
CTGTGCCGTGTTCTGCACCACCGGCCTGCGCGACCTTCATCCTGATCGCCGACTTCATCTCCTGGCCGCGGACTGCTGGAGCTGGGGGCGCTGGAGCCCT
GAAGTACCTGTGGAACCTGCTGCAGTACTGGGGCCAGGAGCTGAAGAACTCCCTGCTGGACACCACCGCCATCCTGCGGCATCGCCGTGGCCG
AGGGGCACCGACCGCGTGGTGGTGATCGAGCGCGGTGGTGCAGCGCGCGACCTGCGCACCATCCCCCGCCGCCATCCGCCGCATCCGCCGCATCCGCCGCAGGGCTTCGAGCGCGCGCC
CTGCTGTAA

SUBSTITUTE SHEET (RULE 26)

Fig. 41A

2003 CON A1 Env

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MRVMGIQRNCQHLLRWGTMILGMIIICSAAAENLWVTVYYGVPVWKDAETTLECASDAKAYETEMHNVWATHACVPTDPNPQEIHLENVTEEF
NMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTTNTHEEEIKNCSFNMTTELRDKKQKVYSLFYRLDVVQINENNSNS
SYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVIIRSENITNNA
KTIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLQKVAKQLRKYFKNKTIIFTNSSGGDLEITTHS
FNCGGEFFYCNTSGLFNSTWNNGTMKNTITLPCRIKQIINMWQRAGQAMYAPPIQGVIRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDN
WRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTV
WGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLIEESQNQQEKNEQDLLA
LDKWANLWNWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLSVINRVRQGYSPLSFQTHTPNPRGLDRPGRIEEEGGEQGRDRSIRLVSGFLA
LAWDDLRSLCLFSYHRLRDFILIAARTVELLGHSSLKGLRLGWEGLKYLWNLLLYWGRELKISAINLVDTIAIAVAGWTDRVIEIGQRIGRA
ILHIPRRIRQGLERALL$
```

Fig. 42A

2003 A1.AnC Env

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MRVMGIQRNCQHLLRWGTMIFGMIIICSAAAENLWVTVYYGVPVWKDAETTLECASDAKAYDTEVHNVWATHACVPTDPNPQEIDLENVTEEF
NMWKNNMVEQMHADIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTTNTHEEEIKNCSENMTTELRDKKQKVYSLFYRLDVVPINENNSNS
SYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVMIRSENITDNA
KTIIVQLTEPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTEWNKTLQKVAAQLRKHFENKTIIFNSSSGGDLEITTHS
FNCGGEFFYCNTSGLFNSTWNNGTMKDTITLPCRIKQIINMWQRVGQAMYAPPIQGVIRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDN
WRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTV
WGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWLQWDKEISNYTDIIYNLIEESQNQQEKNEQDLLA
LDKWANLWNWFDISNWLWYIKIFIMIVGGLRIVFAVLSVINRVRQGYSPLSFQTLTPNEGPDRPGRIEEEGGEQGRDRSIRLVSGFLA
LAWDDLRSLCLFSYHRLRDFILIAARTVELLGRSSLKGLRLGWEGLKYLWNLLLYWGRELKISAINLLDTIAIAVAGWTDRVIEIGQRICRA
ILNIPRRIRQGLERALL$
```

Fig. 41B

2003 CON A1 Env.seq.opt

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ATGGCGGTGATGGGCATCCAGCGCAACTGCCAGCCACCTGCTGCGCGGTGGGGCACCATGATCCTGGGCACCATGATCATCTGCTCCGCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGACGCCGAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGAGA
CCGAGATGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCCACCCTCCCCTGTGGGACCAGTCCCTGAAGCCTGAGCTGACCCC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACACCGACATCATCATCAGCCTGTGGGACCAGTCCCTGAAGCCTGAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCTCCAACGTGACCAACGTGACCCACCAACACCACCCCTGGACGTGGTGCAGATCAAGAACTGCTCCTTCAACA
TGACCACCGAGCTGCGCGACAAGAAGCAGAAGGTGTACTCCCTGTTCTACCGCCTGGACGTGGTGCAGATCAACGAGAACAACTCCAACTCC
TCCTACCGCCTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCGCGCCC
CGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCAACGGCACCGGCCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCACGGCA
TCAAGCCCGTGGTGTCCACGCTGCTGCTGAACGGCTCCCTGGCCGAGGAGGAGGTGATCATCCGCTCCGAGAACATCACCAACAACGCC
AAGACCATCATCGTGCAGCTGACCAAGCCCGTGAAGATCAACTGCACCCGCCCCGGCAACAACACCCGCAAGTCCATCCGCATCGGCCCCGG
CCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACGTGTCCCGCTCCGAGTGGAACAAGACCCTGCAGA
AGGTGGCCAAGCAGCTGCGCAAGTACTTCAAGAACACCTCCGGCGCGATCCTGGAGATCACCAACGACCACCATCACCCT
TTCAACTGCGGCGGCGAGTTCTTCTACTGCAACACCTCCGCCCTGTTCAACTCCACCTGGAACAACGGCACCATGAAGAACAACCATCACCCT
GCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGGGCGTGGGCCAGGCCATGTACGCCCCCCCGCGATCCGCTGCGAGT
CCAACATCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACAACACCGAGACCTTCCGCCCCACCGGCGGGGGGACATGGCGGCGACAAC
TGGGGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCGCGAGGTCCCATCGGCGGCGACCGTGC
GAAGCGGCCGGTGGGCATCGGCCGCCTGCTGTTCCTGGGCGTGGCCGGCAGCACCATGGGCGCCAGCGTGGGCGGCGCCAGCGTG
AGGCCCCCAGCGCTGTGTCCGGCATCGTGCAGCAGCAGAACAACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGGGCCTGCTGACCGTG
TGGGGCATCAAGCAGCTGCAAGCGTGCCCTGGAGGCCCTGGCCGTGGAACGCGTACCTGCGCGACCAGCAGCTGCTCGGCAT
GCTGATCTGCACCACCAACGTGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCAGGAGGAGATCTGGGACAACATGACCTGGATGCAGTGGG
ACAAGGAGATCTCCAACTACACCACCCAGATCTACCACCTGATCGAGGAGAGCCAGCAGGAGGAGAACGAGCAGGACCTGCTGGCC
CTGGACAAGTGGGCCAACCTGTGGAACTGGTTCGACATCTCCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGAT
CGGCCTGCGCATCGTGTTCGCCGTGCTGTCCGTGATCAACCGCGTGCGCCAGGGCTACTCCCCGCTGTCCTTCCAGACCACCACCCCCCAACC
CCCGCGGCCTGGACCGGCCTGGGCGCCATCGAGGAGGAGGGCGGCGAGCAGGGCCGCGAGCGCGACCGCTCCATCCGCCTGGTGTCCGGCTTCCTGGCC
CTGGCCTGGGACGACCTCCCTGTTCTCCTACCACCGCCTGCGCGACTTCATCCTGATCGCCGCGGCGTGATCCGCGCCATCGGGGCCGCATCGGCGGCCGCGCC
GGGGCCACTCCTCCCTGAAGGGCCTGCGCCTGGGCTGGGAGGGCCTGCGCTACCTGGGCTCGGGCTGCTGCCGCGAGAGA
TCTCCGCCATCAACCTGGTGGACACCATCGCCATCGCCGTGGGGCCGGGGGCGGCCCGTGCCCATCGGCGCCAGCGATCGGCGCCGCGCC
ATCCTGCACATCCCGCGCCCCGCCCCGCCCCAGGGCCTGCGCCGCGGGCCCTGCGCCGCGCCGCCCAGGGCCTGCGGCGGCCCTGCTGTAA
```

Fig. 42B

2003 A1.anc Env.seq.opt
ATGGCGCGTGATGGGCATCCAGCGCAACTGCCAGCACCTGTGGCGCTGGGCACCATGATCTTCGGCATGATCATCTGCTCCGCCCGA
GAACCTGTGGGTGACCGTGACTACGGCGTGCCCGTGTGGAAGGACGCCGAGACCTCACCCTGTTCTGCGCCAAGGCCTACGACA
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGCCGACATCATCTCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCGAGCTGCGCGACAAGAAGCAGAAGGTGTACTCCCTGCCCCCAAGGTGTCCTTGAGCGTGGTGCCCATCAACGAGAACA
TGACCACCGAGCTGCGCGACAAGCTGCAACTGCTGACTCCGCCGATCAACTGTCCCTGTTCTACCGCGCCAAGGTGTCCTTGAGCGTG
TCCTACCCGCCTGATCAACTGCACCTCCGCCATCCCGCCGCGGTGTCCTTGAGCGTGGTGCCCATCAACGAGAACAAC
CGCCGGCTTCGCCATCTGAAGTGCAAGAAGGAGTTCAACGGCACCATCACCCTGAGCGTGCACCCACGGCA
TCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGACCGAGATGCACCTGGCCGTGATCTTCTACGCCACCGGACATCATCGGCGCAACGCCCCGG
AAGACCATCATCGTGACCGCAGCTGAAGATCAACTGCACCCGCAAGTGTCCCGCCACTGCCAGCGCCAGGCCTTCTACGCCACCGG
CCAGGCCTTCTACGCCACCGGCGACATCATCGGCGCAAGCACTTCAACAACAAGACCTCCGGCCTGTTCAACTCCAACGCCAGGTGGTGTC
AGGTGGCCGCCCAGCTGCGCGAGTTCTTCTACTGCAACAACACCTCCGGCCTGTTCAACTCCAACGCCAGGGTGGTGTCCGAGT
GCCCTGCCGCATCAAGCAGCAGATCATCAACATGTGGCAGGCCGTGGGCAACAACAACAACAGGCCCCTGGGCGTGCGCCGCGACAAC
CCAACATCACCGGCCTCCGAGCTGCTGCGACCCGGCGGCGCAACAACAACACCCTGGGCGTGCGCGGCATGCGCGACAAC
TGGGCCGATCGGCGTGTACAAGGTGGTGAAGATCCAGCGCCGTGTTCCTGGGCTTCCTGCAGCAGTCCGTGGAGCGCGA
GAAGCGCGCCGCCAGCTGCCGCCGGCGCGGCTGGGCGTGTTCCTGGGCCATCGTGCGCCCGCGCCCATGGGCCGTGGAGCGCGA
AGGCCCGCGCCGCCAGCTGCCGCCGGCGCGGCTGGGCGTGTTCCTGGGCCATCGTGCGCCCGCGCCCATGGGCCAGCAGTCCGTGGAGCGCGTG
TGGGGCATCGAGCAGCTGCCACCAACGTGCCCTGGAACTCCTCCTGGAACTCATCATCTACAACAAGCTGGACGCTCCGGCTGCTGGGCCTGAAGCTGACCGTG
GCTGATCTGCCACCAACGTGCCCTGGAACTCCTGGAACTCATCATCTACAACAACTGGACGCTCTGGGGCCTGCTGGGGCCTGAAGCTGACCGTG
ACAAGGAGATCTCCACCACGGCAGTCTCCAACTACAACCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGAACCAGCAGGACCTGCTGGCC
CTGGACAAGTGGGCCAACCTGTGGAACTGGTTCGAACATCTCCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGAT
CGGGCCTGCGCATCGTGTTCGCCCGCGCCGGGCCATCGAGGAGGAGGCCGGAGATCGAGGAGGACGGCGGCCAGGCGGCCTTCCTGGCC
CCGAGGGCGGCCCGACCGGCCTGCGCGCCTCCGTGTTCTCCTGGCGGGCCTGGGCTGGGGCTGGGAGAGCTGCT
CTGGCCTGGGACGACCTGCCCCTGAAGGCCTGGGGGGCTGCGCTGGGGGCATCCGGCCGTGTACTGGGCGCGCCGCCGCGAGCTGAAGA
TCTCCCGCATCAACCTGCTGGACACATCCGCCCGCCATCGCCATGCTGGACACCGTGGGGCCTGTACTGGGCGCGCCGCGAGCTGAAGA
ATCCTGAACATCCCCCGCCGCCATCCGCCCAGGGCCTGGGGGCCTGGAGCGCGCCCATCTGCCCGCGCC
CTGTAA

Fig. 39B

2003 CON-S Env.seq.opt

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ATGCGCGTGATGGGCATCCAGCACCTGTGGCGCTGGGCCATCCTGCTGGGCATGCTGATCATCTGCTCCGCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGCTGGTGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCGACGTGAACGCCACCAACACCACCAACCAACCACCACCAACATCACCA
CCGAGATCCGCGACAAGGAGCAGAAGGTGTACGCCCTGTTCTACAAGCTGGACGTGGTGCCCATCCCAGCCACTACTGCGCCCCCGCCCCAT
AACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCCCGCAGTGCACCAACGCCAAGCCGGTGT
CCTGAAGTGCAACGACAAGAAGTTCAACGGCACGGCCTCCCTGGCCGAGGAGGAGATCATCATCCGCAGCGAGAACATCACCAACGCCAGCACCATCGTG
CAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAACAACAACACCCGCAAGAGCATCCGCATCGGCCCGGCCAGGCCTTCTACGC
CACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCCGCGCCGACCTGGAGATCAACAACACCATCACCTCCGCGGGCGAC
TGCCGGCCACTTCAACAAGACCATCATCTTCAACCCTCCGCTGGAACTCCACCTGGAGATCATCTCCGCATGGAGATACCACCATCAGCGGCGAC
TTCTTCTACTGCAACACCTCCGAGCTGTTCAACTCCACCTGGAACGGCACCAACACCATCACCCTGCCCTGCCGCATCAAGCAGATCAT
CAACATGTGGCAGGGCGTGGGCAAGGCCATGTACGCCCCCCCCATCGAGGGCCAGGTGCCAGCTGCTGCTGC
CCCGCGACGGCGGCAACAACAACACCGAGACCTTCCGCCCCGGCGGAGGCGACATGCGCGACAACTGGCGCAGCGAGCTGTACAAGTACAAC
GTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGCCGCGTGGTGCAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGT
GTTCCTGGGCTTCCTGGGAGCAGTCCAAGCTGACCGCCCGCCCAGCTGCTGCTGCTCGAGGCCCCAGCTGGCCGCCGGCAGCACCATGGGGCCCCGC
TGCAGCAGCAGTCCAAGCTGACCGCTGGGCGCCCCAGAGCAGCCAGAGTGCTGACCAGCTGCTCGGGCCAGGCCCGGC
GTGTGCTGGCCGTGGAGCGCTACCTGAAGGACCAGCAGCTGCTGGGGACCTGTGGGGCTGACCTGGGCTGTGGGCATCAAGCAGCTGCAGGCCCGCGTCCTG
GAACTCCTCCTGGTCCAACAAGTCCCAGACGGACGAGATCTGGGACAACATGACCTGGATGGAGTGGGACAGAGAGATCAACAACTACACCGACA
TCATCTACTCCCTGATCGAGGAGTCCCAGAACCAGAAGGAGAAGAACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAAC
TGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGGCCTGAAGCGCTTCCTGCTGTTCCGCTGCT
GTCCATCGTGAACCGCGTGCGCCAGGGCTACAGCCCGCTGTCCCTGGTGAACGGCTTCCTGGCCCTGGCCTGGGAGGCCCTGAA
TGCCTGTTCTCCTACCACCGCGCCTGCGCGACCTGATCCTGATCGTGACTCGGGGGCTGGAGAGGCTCAGTAGGGCACCACCGCCATCTGGTGAAGG
GTACCTGTGGAACCTGCTGCAGTACTGGGGCCAGGAGCTGAAGAACTCCGCCATCAGCCTGCTGGACACCACCGCCATCGCCGTGGCCGAGG
GCACCGACCGCGTGATCGAGGTGGTGCAGCGCGCGTGCGCGCCATCCTGAACATCCCCCGCCGCATCCGCCAGGGCTTCGAGCGCGCCCTG
CTGTAA
```

Fig. 43A

2003 CON_A2 Env

```
MRVMGTQRNYQHLWRWGILILGMLIMCKATDLWVTVYYGVPVWKDADTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVNLENVTEDFN
MWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCSNANTTNNSTMEEIKNCSYNITTELRDKTQKVYSLFYKLDVVQLDESNKSEYYYR
LINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDPRFNGTGSCNNVSSVQCTHGIKPVASTQLLLNGSLAEGKVMIRSENITNNAKNI
IVQFNKPVPITCIRPNNNTRKSIREGPGQAFYTNDIIGDIRQAHCNINKTKWNATLQKVAEQLREHFPNKTIIFTNSSGGDLEITTHSFNCG
GEFFYCNTTGLFNSTWKNGTTNNTEQMITLPCRIKQIINMWQRVGRAMYAPPIAGVIKCTSNITGILLTRDGGNNETETFRPGGDMRDNWR
SELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGMGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLKAIEAQQHLLKLTVWG
IKQLQARVLALERYLQDQQLLGIWGCSGKLICATTVPWNSSWSNKTQEEIWNNMTWLQWDKEISNYTNIIYKLLEESQNQQEKNEQDLLALD
KWANLWNWFNITNWLWYIRIFIMIVGGLIGLRIVIAIISVVNRVRQGYSPLSFQIPTPNPEGLDRPGRIEEGGGEQGRDRSIRLVSGFLALA
WDDLRSLCLFSYHRLRDCILLAARTVELLGHSSLKGLRLGWEGLKYLWNLLLYWGRELKNSAISLLDTIAVAVAEWTDRVIEIGQRACRAIL
NIPRRIRQGFERALL$
```

Fig. 44A

2003 CON_B Env

```
MRVKGIRKNYQHLWRWGTMLLGMLMICSAAEKLWVTVYYGVPVWKEATTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVVLENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDMNATNTNTTIIYRWRGEIKNCSFNITTSIRDKVQKEYALFYKLDVVPIDND
NTSYRLISCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAEEVVIRSENFTD
NAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQIVKKLREQFGNKTIVFNQSSGGDPEIVM
HSFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPPIRGQIRCSSNITGLLLTRDGGNNETEIFRPGGGDM
RDNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAMFLGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQ
LTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPWNASWSNKSLDEIWDNMTWMEWEREIDNYTSLIYTLIEESQNQQEKNEQE
LLELDKWASLWNWFDITNWLWYIKIFIMIVGGLVGLRIVEAVLSIVNRVRQGYSPLSFQTRLPAPRGPDRPEGIEEEGGERDRDRSGRLVDG
FLALIWDDLRSLCLFSYHRLRDLLLIVTRIVELLGRRGWEVLKYWWNLLQYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQRACRAILHI
PRRIRQGLERALL$
```

Fig. 43B

2003 CON A2 Env.seq.opt
ATGCGCGTGATGGGCACCAGCGCAACTACCAGCACCTGTGGCGCTGGGCATCCTGGGCATGCTGCTGATCATGTGCAAGGCCACCGA
CCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGACGCCGACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCG
AGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGGTGAACCTGGAGAACGTGACCGAGGACTTCAAC
ATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGTCCTGAAGCCCTGCGTGCGTGACCCCCCT
GTGCGTGACCCTGAACTGCTCCAACGCCAACAACTCCAACATCCACAACGGCTCCTACAACATCACCAGTCCGAGTACTACCGC
CTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCCACTACTGCGCCCCGGCTT
CGCCATCCTGAAGTGCAACGACCCCGGCTTCAACGGCACCGGCTCCCTGGCCGAGGGCAAGGTGTCCTGCAACAACGTGTCCACCGTGCAAGCCCG
TGGCCTCCACCCAGCTGCTGCTGAACGGCAGCGTCCCTGGCCGAGGGCAAGGTGATGATCCGCGCCGAGAACATCACCAACAACGCCAAGAACATC
ATCGTGCAGTTCAACGACACTCATCGGCGACATCCGCGCCACTGCCAACAAGAACCAAGTGGAACCACCCTGCAGAAGTGGCCGAGC
CTACACCAACGACACCATCTCCCCAACAAGACCATCTTCACCAACTCCTCCGGCGGAGATCACCACCTCCTCAACTGCGGC
AGCTGCGGAGCACTTCCCCAACATGGTGAGCAGCTGCCTGTTCAACTCGTGCAGCAGCATCGTGCAGCAGCCCTGGCCGTGGGGC
GGCGAGTTCTTCTACTGCAACACACCACCGCCTGTTCACCTGGCCGCGTGGGCCGCCATGTACGCCCCCATCACCGGCGGCGGCCTGCACCTCCA
CTGCCGCATCAAGCAGCATCATCCTGACCCGCCATCATCCCGACCCGCGACGGGCCGCAACAACGAGACCCTTCCGCCACCGCCCGGCGCGGC
ACATCACCGGCATCAGTTGGGCCGCGGCAACCCGGGCCCTGGGCGTGGCCCCCGCGCCCGCCCCATGGGCCTCCATCGGGCTGAAGGCCCATGTGGTGGGGC
TCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGAGCCCCCTGGGCGTGGCCCCGCGCGTGGTGGAGCGGCGAGAAGCG
CGCGTGGGGCATGGGCGCCGTGTTCCTGGGCGCCGTCATCGTGCAGCAGCAGTCCAACCTGCTGAAGGCCATCGAGGCCCAGCACCTGCTGAAGCTGACCGTGTGGGGC
GCCAGCTGCTGCTCCGGGCACCGTGCCCGTGCCCTGGAACTCCTCGGTTCTTACAAGCTGCTGGAGGACCAGTCCCAACAAGAGACCCAGGAGGAGAATCGAT
AGATCTCCAACTACACCAACATCATCTACACAAGCTGCTGGAGGAGTCGCTGTGGTACAACATGGGCTACCTGTTCATGATGGTGGGGCCTGATCGGCCT
AAGTGGGCCAACCTGTGGAACTGGTTCAACATCTCCGGTGAACCGGCTGCGCGAGGCGCCGAGCTACTCCCCCCAGATCCCCAACCCCGAGG
GCCGCATCGTGATCGCCCCCGCCCCGCCATCGAGGGCGGCGCGAGCAGCAGGCCGCCACCGCCTGCCCCTGCTGCGGCCTTCCTGGCCC
TGGGACGACCTGCGCTCCCTGTGCCGCTTCGCCTCCTACCACCGCCTGCCCGACTGCATCCTGATCGTGAACCGGCCGTGTACTGCTGCTACCTGTGAAGAACTCCG
CCATCTCCCTGCTGGACAACCATCAGCCGCCGCCGTGATCGTGATCGAGAGATCCGCGCCGCGCCCATCCTG
AACATCCCCGCCCGGCCATCCGCCCCCCGCCAGCCCGCGCTTCGAGCCCGTGCTGTAA

Fig. 44B

2003 CON B Env.seq.opt

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ATGCGCGTGAAGGGCATCCGCAAGAACTACCAGCACCTGTGGCGCTGGGCACCATGCTGCTGGGCATGCTGATGATCTGCTCCGCGCCGA
GAAGCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGGTGGTGCTGGTGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGTCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCGACCTGAAGAACGCCACCAACACCAACAACAGCAGCGAGGGCATGAAGAACTGCAGCTTCAACATCA
GCTCCTTCAACATCAACACCAAGAACAGCAGAAGGTACGGCCTGGAGAAGTGCCAGACCTGGTGCCCATCCCCATCCACTCTG
CGCCCCCGCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCAACGGCACCGGCCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCC
ACGGCATCCGCCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCAGCCTGGCCGAGGAGGAGGTCGTGATCCGCTCCGAGAACTTCACCGAC
AACGCCAAGACCATCATCGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAACAACAACACCCGCAAGAGCATCCGCATCGG
CCCCGGCCGCGCCTTCTACACCACCGGCGAGATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCCGCGCCAAGTGGAACAACACCC
TGAAGCAGATCGTGAGCAAGAGCTGCGCGGCGAGTTCTTCTACTGCAACACCAGCCTGTTCAACTCCACCTGGAACAACACCGAGGGG
CACTCCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCAACACCAGCCTGTTCAACTCCACCTGGAACAACACCGAGGGG
CAACAATCACCCTGCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGGAGGTGGGCAAGGCCATGTACGCCCCCCCCATCCGCGGCGGCCAGA
TCCGCTGCTCCTCCAACATCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACAACGAGACCGAGACCTTCCGCCCCGGCGGCGGCGACATG
CGCGACAACTGGCGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGCCGCGTGGT
GCAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCTGGGCTTCCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATGACCCC
TGACCGTGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGAACAACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGCAG
CTGACCGTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACCTGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTG
CTCCGGCAAGCTGATCTGCACCACCGCCGTGCCCTGGAACGCCTCCTGGTCCAACAAGTCCCTGGACCAGATCTGGGACAACATGACCTGGA
TGGAGTGGGAGAGCTGGATCGGCGAGATCGGCGACAACTACACCACCCTGATCTACACCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGAACGAGCAGGAG
CTGCTGGAGCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCACCAAGTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGG
CGGCCTGGTGGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCGCCTG
TGCCCGCGCCCCCCGACCTGCTCCGGCCTCCCCGAGGGCATCGAGGAGGGCGGCGAGCGCGACCGCGGCCGCTCCGGTCGCGCTGGGACGGC
TTCCTGGCCCTGATCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCGCCTGCGCGACCTGCTGCTGATCGTGACCCGCATCGT
GGAGCTGCTGGGCCGCCGCGGCTGGGAGGTGCTGAAGTACTGGTGGAACCTGCTGCAGTACTGGTCCCAGGAGCTGAAGAACTCCGCCGTGT
CCCTGCTGAACGCCACCGCCATCGCCGTGGCGAGGGCACCGACCGCGTGATCGAGGTGGTGCAGCGCGCTGGCCGCGCCATCCTGCACGTGT
CCCGCCGCATCCGCCAGGGCCTGGAGCGCGCCCTGCTGTAA
```

Fig. 45A

2003 B.anc Env

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MRVKGIRKNCQHLWRWGTMLLGMLMICSAAENLWVTVYYGVPVWKEATTLFCASDAKAYETEVHNVWATHACVPTDPNPQEVVLENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLLNATNTNSTNMYRWRGEIKNCSFNITTSIRDKMQKEYALFYKLDVVPIDNN
TSYRLINCNTSVITQACPKVSFEPIPIHYCTPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIRPVVSTQLLLNGSLAEEEVVIRSENFTDN
AKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYATGEIIGDIRQAHCNLSRAKWNNTLKQVTKLREQFDNKTIVENPSSGGDPEIVMH
SFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPPIRGQIRCSSNITGLLLTRDGGNNETEIFRPGGGDMR
DNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAMFLGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQL
TVWGIKQLQARVLAVERYLRDQQLLGIWGCSGKLICTTVPWNASWSNKSLDEIWNNMTWMEWEREIDNYTGLIYTLIEESQNQQEKNEQEL
LELDKWASLWNWFDITNWLWYIKIFIMIVGGLVGLRIVFAVLSIVNRVRQGYSPLSFQTRLPAPRGPDRPEGIEEEGGERDRDRSGRLVNGF
LALIWDDLRSLCLFSYHRLRDLLLIVARIVELLGRRGWEALKYWWNLLQYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQRACRAILHIP
RRIRQGLERALL$
```

Fig. 46A

2003 CON C Env

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MRVRGILRNCQQWWIWGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTLFCASDAKAYEKEVHNVWATHACVPTDPNPQEIVLENVTENF
NMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEIKNCSFNITTELRDKKQKVYALFYRLDIVPLNENNSYRLINC
NTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAEEIIRSENLTNNAKTIIVHL
NESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKWNKTLQKVSKKLKEHFPNKTIKFEPSSGGDLEITTHSFNCRGEF
FYCNTSKLFNSTYNSTNSTITLPCRIKQIINMWQEVGRAMYAPPIAGNITCKSNITGLLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKV
VEIKPLGIAPTKAKRRVVEREKRAVGIGAVELGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVWGIKQLQTRV
LAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEDIWDNMTWMQWDREISNYTDTIYRLLEDSQNQQEKNEKDLLALDSWKNLWNW
FDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLGRIEEEGGEQDRDRSIRLVSGFLALAWDDLRSLC
LFSYHRLRDFILIAARAVELLGRSSLRGLQRGWEALKYLGSLVQYWGLELKKSAISLLDTIAIAVAEGTDRIIELIQRICRAIRNIPRRIRQ
GFEAALQ$
```

Fig. 45B

2003 B.anc Env.seq.opt

ATGGCGCGTGAAGGGCATCCGCAAGAACTGCCAGCACCTGTGGCGCTGGGGCCACCATGCTGCTGGGCCATGCTGCTGATGATCTGCTCCGCCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCCGTGTGGAAGGAGGCCACCACCACCCCGTGTTCTGCGCCTCCAGGAGGTGGTGCTGGAAGCGTGGACGGAACTTC
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCAGGAGGTGCTGGAAGCCCTGTGCGTGCGTGAAGCTGACCCC
AACATGTGGAAGAACAACATGTGGAGCAGATGCACGAGCAGACCTGCGAACCGCCACCAACAATCATCTCCCTGTGGGACCAGTCCTGCGTGCGTGAAGCTGACCCC
CCTGTGCGTGGTGACCCTGAACTGCACCGACCTGCGAACGCCACCAACAACAACTTACACCGTGGCGGCGAGATCGAACAACAAC
GCTCCTTCAACATCACCACCTCCATCCGCGACAAGATGCAGAAGGAGTACGCCCTGTTCTACAAGTCTGGACGTGGTGCCCATCCACTACTGCAC
ACCTCCTACCGCCGGCTTCGCCACTGCAACTGCACCGACCTGCGAATCCCGTGCCCTGCCCGGCCACCGGTCCTGCCGAGAACGTGTCCACCGACAAAC
CCCCGCCGGCTTCGCCCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGAGGAGGTGGTGATCCGGTCCCGAGAACTTCACCGACAAAC
GCATCCGCCTGCGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGAGGAGGTGGTGATCCGGTCCCGAGAACTTCACCGACAAAC
CGGCCGCCGCCTTCTACGCCACCGGCGAGATCATCGGCGACAACAAGACCACCCAGTCCTGTTCAACTCCACCTGGAACGCACCTGGAACAACACCCTGA
AGCAGGTGGTGACCAAGCTGCGCGAGTTCTTCTACTGCAACAACAGACCCCAGCTGTTCAAGCTGTGTTCAACTCCACCTGGAACGCACCTGGAACAACACCCTGAT
TCCTTCAACTGCGGCGGCGAGTTCTTCTACTGCAACAAGCAGATCAACAATCATCAACAATGTGGCAGGCGGCAACGAGACCCCCATCCGGCGGCGACATCGCGC
CATCACCCTGCCCCTGCCCGCCATCAAGCAGATCAACAATCATCAACAATGTGGCAGGCGGCAACGAGACCCCCATCCGGCGGCGACATCGCGC
GCTGCTCCTCCAACATCACCGGCCTGCTGTTCGACCCGCTGCTGACCCGCTGGGCGCCGCAACGAGATCGAGCCCCTCCGGGGCGTGGCCCGCGGGTGCA
GACAACTGGCGTCCGAGCTGTGTACAAGTGGTGAACAGGTGGTGAACATCGAGCAGCAGCAGCCGCCCTCCATGGGCGGCCTCCATGGGCGTGGTGCA
GCGCCGAGAAGCGCGCCGCCAGCTGCTGTCCCGGCCATCGTGCCCGGCAGCAGCAGAACAACCTGCTGCGGCGCCCTCCATGGGCGTGCAGCTG
CCGTGCAGCAGCGCGCCGCCAGCTGCTGTCCCGGCAGCAGCAGAACAACCTGCTGCGGCGCCCTCCATGGGCGTGGTGCAGCTG
ACCGTGTGGGGCGAGATCAAGCAGCTGACACCACCACCGGTGCCCGGAGCGCGAGCTGCTGGGCGCCGTGCTGGGGCTGCTGGGCCTGCTC
CGGCAAGCTGATCTGCACCACCGCCGTGCCCGTGGCCTCCGGAGCGCGAGCTGCTGGGCGCCGTGCTGGGGCTGCTGGGCTGCTC
AGTGGGAGCGGCGAGATCGAGGACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGG
CTGGAGCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGG
CCTGTGGCGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTCGTGAACCGTGCGCCAGGGCTAGTCCCCCCGTGCCTTCCAGACCCGCCTGC
CCGCCCCCCCGACCGCCCGACCGCATCGAGAGCGCGAGCGCCCTGGCTCCCTCCGCGCCCCTGGTGCCCGCCCTCCGGCGCCTGGTGCCCGCCCTCGGAACGGCTTC
CTGGCCCTGATCTGGGACGAGCGCCGCGCCATCGCCGGCGGCGGGTGGGAGCCGGCCCTGAAGTACTGGTGGAACCTGCTGCAGTACTGGTCCCAGGAGCTG
GCTGCTGGGCCTGGGCGCCGGCCATCGCCGGCGGCGGGTGGGAGCCGGCCCTGAAGTACTGGTGGAACCTGCTGCAGTACTGGTCCCAGGAGCTG
GCTGCTGGGCCTGGGCGCCGGCCCATCGCCGGCGGCGGGTGGGAGCTGTGATCGCCGTGATCGAGGGCACCGACCGCGTGGTGTCCTGTGCCCGCCCTGAAGAACTCCCGCCGTGTCCC
TGCTGAACGGCCATCCGCGCCGCGCCATCGCCGGGCGCGCCGTGGGCGCCCATCGAGGGCACCGACCGCGTGGTGTCCTGTGCCCGCCCTGAAGAACTCCCGCCGTGTCCC
CGCCGCCATCCGCGCCGCGCCAGGGCGCCCTGGACGCGCTGGGAGGCGCCTGCTGGGCGCCGCGCCCTGCTGTAA

Fig. 46B

2003 CON_C Env.seq.opt

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ATGGCGCGTGCGCGGCCATCCTGCCCAACTGCCAGCAGTGGTGGTGGATCTGGGGCATCCTGGGCTTCTGGATGATGCTGATGATCTGCAACGTGGTGGG
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGAGA
AGGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACGACATGGTGGACCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCGACCTGAACGCCACCAACGCCACCAACGGGCCTGGAGATCAAGAACTGCTCCTTCAACATCACCACCGAGC
TGCGCGACAAGAAGCAGAAGGTGTACGCCCTGTTCTACCGCCTGGACATCGTGCCCCTGAACGAGAACAACTCCTACCGCCTGATCAACTGC
AACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGACCCCATCCCCATCCACTACTGCGCCCCCGCCGGCTACGCCATCCTGAA
GTGCAACAACAAGACCTTCAACGGCACCGGCCCCTGCAACAACGTGTCCACCGTGCAGTGCACCCACGGCATCAAGCCCGTGGTGTCCACCCTG
AGCTGCTGCAACGGCTCCCTGGCCGAGGAGGAGATCATCATCCGCTCCGAGAACCTGACCAACAACGCCAAGACCATCGTGCACCACCGG
AACGAGTCCGTGGAGATCGTGTGCACCCGCCCCAACAACAACACCCGCAAGTCCATCCGCATCGGCCCCGGCCAGGCCTTCTACGCCACCGG
CGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCGGGAGGACAAGCCTGAGAACAAGAACATCCTCTGCCCTGCCCTGAGGTGAAGG
AGCACTTCCCCAACAAGACCATCAAGTTCGAGCCCTCCTCCGGCGGCGACCTGGAGATCACCACGCCCACCTTCAACTGCCGCGGCGAGTTC
TTCTACTGCAACACCTCCAACCTGTTCAACGGCACCTACAACGGCACCTACAACCTCCACCTACCCGCCCCATCCGCCAGCCTGCTGCTGACCC
CATGTGGCAGGAGGTGGGCCGCGCCATGTACGCCCCCCCCATCGCCGGCGGGCAAGATCTCCTGCAAGTCCAACATCACCGGCCTGCTGCTGACCC
GCGACGGCGGCAACAACAACACCGAGACCTTCCGCCCCGGCGGCGGCGAGATGCGCGACAACTGGCGCTCCGAGCTGTACAAGTACAAGGTG
GTGGAGATCAAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGCCGCGTGGTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTT
CCTGGGCTTCCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATCACCCTGACCGTGCAGGCTCGCCAGCTGCTGTCCGGCATCGTGC
AGCAGCAGTCCAACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGCAGCTGACCGTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTG
CTGGCCATCGAGCGCTACCTGAAGGACCAGCAGCTCCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTGCACCACCGCCGTGCCCTGGAA
CTCCTCCTGGTCCAACAAGTCCCTGGAGGACATCTGGGACAACATGACCTGGATGCAGTGGGACCGCGAGATCTCCAACTACACCGACACCA
TCTACCGCCTGCTGGAGGACTCCCAGAACCAGCAGGAGAAGAACGAGAAGGACCTGCTGGCCCTGGACTCCTGGAAGAACCTGTGGAACTGG
TTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTC
CATCGTGAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCGCCTGCCCGCCCCGCGCGGCCCTGGACCGCCTGGGCCGCATCGAGGAGGGCCTGGGCAGGACCTGGAGGCAGTCGCGGGGCCCTGGGGCTGAAGAAGTCCTGGAGGCTGGAGAG
AGGAGGAGGGCGGCGAGCAGGACCGCGACCGCTCCATCCGCCTGGTGTCCGGCTTCCTGGCCCTGGCCTGGGACGACCTGCGCAGCCTGTGC
CTGTTCTCCTACCACCGCCTGCGCGACTTCATCCTGATCGCCGCCCGCGCCGTGGAGCTGCTGGGCCGCTCCTCCCTGCGCGGCCTGCAGCG
CGGCTGGGAGGCCCTGAAGTACCTGGGCTCCCTGGTGCAGTACTGGGGCCTGGAGGTGAAGAAGTCCGCCATCTCCCTGCTGGACACCATCG
CCATCGCCGTGGCCGAGGGCACCGACCGCGTCATCGAGATCGTGCAGCGCATCTGCCGCGCCATCTGCAACATCCCCCGCCGCATCCGCCAG
GGCTTCGAGGCCGCCCTGCAGTAA
```

Fig. 47A

2003 C.anc Env

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MRVMGILRNCQQWWIWGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTTLFCASDAKAYEREVHNVWATHACVPTDPNPQEMVLENVTENF
NMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEMKNCSFNITTELRDKQKVYALFYRLDIVPLNDNNSYRLINC
NTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAEEIIIRSENLTDNAKTIIVHL
NESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEEKWNKTLQRVGEKLKEHFPNKTIKFAPSSGGDLEITTHSFNCRGEF
FYCNTSRLFNSTYNSKNSTITLPCRIKQIINMWQGVGRAMYAPPIAGNITCKSNITGLLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKV
VEIKPLGIAPTEAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVWGIKQLQTRV
LAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEEIWDNMTWMQWDREISNYTDTIYRLLEDSQNQQEKNEQDLLALDSWENLWNW
FDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLGRIEEGGEQDRDRSIRLVSGFLALAWDDLRSLC
LFSYHRLRDFILIAARAVELLGRSSLRGLQRGWEALKYLGSLVQYWGLELKKSAISLLDTTAIAVAEGTDRIIELIQRICRAIRNIPRRIRQ
GFEAALL$
```

Fig. 48A

2003 CON_D Env

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MRVRGIQRNYQHLWRWGIMLLGMLMICSVAENLWVTVYYGVPVWKEATTLFCASDAKSYKTEAHNIWATHACVPTDPNPQEIELENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVKRNNTSNDTNEGEMKNCSFNITTEIRDKKQVHALFYKLDVVPIDDNNSNT
SYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKCKDKKFNGTGPCKNVSTVQCTHGIRPVVSTQLLLNGSLAEEIIIRSENLTNNA
KIIIVQLNESVTINCTRPYNNTRQRTPIGPGQALYTRIKGDIRQAHCNISRAEWNKTLQQVAKKLGDLLNKTTIIFKPSSGGDPEITTHSF
NCGGEFFYCNTSRLFNSTWNNTKWNSTGKITLPCRIKQIINMWQGVGKAMYAPPIEGLIKCSSNITGLLLTRDGGANNSHNETFRPGGGDMR
DNWRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAIGLGAMFLGELGAAGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQL
TVWGIKQLQARILAVERYLKDQQLLGIWGCSGKHICTTTVPWNSSWSNKSLDEIWNNMTWMEWEREIDNYTGLIYSLIEESQNQQEKNEQEL
LELDKWASLWNWFSITQWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLLPAPRGPDRPEGIEEGEGQGRGRSIRLVNGF
SALIWDDLRNLCLFSYHRLRDLLLIAARIVELLGRRGWEALKYLMNLLQYWIQELKNSAISLFDTTAIAVAEGTDRVIEIVQRACRAILNIP
TRIRQGLERALL$
```

Fig. 47B

2003 C.anc Env.seq.opt

ATGGCGCGTGATGGGCATCCTGCCAACTGCCAGCAGTGGTGGATCTGGGGCATCCTGGGCTTCTGGATGATCTGCAACGTGGTGGG
CAACCTGTGGGTGACCGTGTACTGGGCCGTGTGGAAGGAGGCCAAGACCACCCTGTTCTGCGCCTCCGACGCAAGGCCTACGAGC
GCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACAATCATCTCCCCTGTGGGACCAGTCCCTGCGTGAAGCTGACCCC
AACATGTGGAAGAACGACATGGTGACCAGCCAGAGACATCATCACCAACAGCCACCAACGCTCCTTCAACATCACCACCGAGC
CCTGTGTGCCGACCCTGACCCTGAACTGCGACAAGCGCCACCAACGCCGTCGTGCCCTGCGTGAAGCTGACCACCGAGC
TGCGCGACAAGAAGCAGAAGGTGTACGCCCTGTTCTACGCCGTGGACATCGTGCCCCTGGACATCGTGCCCATCCCACTACTGCGCCCCGCGGCTACGCCATCCTGAA
GTGCAACAACAAGACCTTCAACGGCAGGCTCCCTGCCCCAAGGTGTCCTTCGCAACAACGTGTCCACCGTGCCCTGCGTGCCACCCTG
AGCTGCTGAACGGCTCCCTGGCCGAGGAGGAGATCATCATCCGCGAGAACCTCCAGCTCCATCCGGCCACCCG
CGACATCATCGGCACCGCGACATCCGCGCCAGCCCACTGCACCCCCTCCTCCGGCGGCGACCTGGGCGAGAAGCTGAAGG
AGCACTTCCCAAGAAGACCATCAAGTTCGCCCCCTCCTGCGCCCGCCATCGCCGCCATCTCCAACTGCGGGGCGAGTTC
TTCTACTGCAACACCTCCCGCCTGTTCAACTCCAAGAACTCCACCATCACCCTGCCCTGCCGCATCAAGCAGATCATCAA
CATGTGGCAGGGCCGTGGGCGCCCATGTACGCCCCCCCCGCGGCGGCGCAACAGCCTGCTGTGTACGTGTACCAGGTG
GCGACGGCGGCAAGAACAACACCGAGACCTTCCGCGGCGCATCGCCCCCCACCGGAGCTCAAGCGCCGCCCGCCGGGCATCGTGTC
GTGGAGATCAAGCCCCCTGGGCCATCGCCCCCGCCTCCACCAATGGGCGCCAGCAGCACCGTGTGGGGCCATCCCGCGTG
CCTGGGCTTCCTGGCCGCCGGCGCCAGCGACCATGCTGCTGGGGCTGCTGCCGCCCGCGCCAGCAGCACCGTGTGGGGCCATCCCGCGTG
AGCAGCAGTCCAACGCCCAGCCTGCTGCGCCTACCTGAAGGACCAGCAGCTGCTGGGCGCTGCTGTCCCGCGGCTGATCGTGCACCCGCCGCCCTGGAA
CTCCTCCTGGTTCCAACAAGTCCCAGAGGAGAGATCGGGACAACAGCAGCACGCGAGATCCCAACTACACCGACACCA
TCTACCGGCCTGCTGGAGGACTCCCAGGAACTCCCAGAGATCTCTGGGGAGAAACCTGTGGAACTGG
TTCGACATCACCAACTGGCTGCTGCGCCAGGCGTGGGCGGCTGATCGGGCCTGGCCATCATCTTCGGCGTGCTGTC
CATCGTGAACCGCGTGCGCCAGGGCTACTCCCCCTGTCCTTCCAGACCCGCCTGGTCTCCGGCTTCATCCGCCTGTGC
AGGAGGAGGGCGGGCGAGCAGGACCCGGGCCGTGGGCCCGCGTCCTGGGCGTGCTGGGAGCTGCTGAAGTCCGCGGCTGGACACCATCG
CTGTTCTCCTACCACCGCCTGCGCGACTTCATCCTGATCGTGGTGCAGCGCGCCCTGGAGGCCCTGGAGCTGAAGAAGTCCGCGGCTGGACACCATCG
CGGCTGGGAGGCCGTGGCCGAGGCCACCGCCAGTACTGGGGCTCCGGCAGTACTGGGCCTGAGAAGTACTGCGCGCCCATCTCTGCCGCCGAACATCCGCGCCATCCG
CCATCGCCGTGGCCGAGGGCCACCGAGCTGATCATCGAGAGCTGATCCAGCGCGACACCGCCGCCATCTCGCCGCCATCTGCGCCGCCATCCGCCAG
GGCTTCGAGGCCGTGGCCGAGGCCCCTGCTGTAA

Fig. 48B

2003 CON D Env.seq.opt

ATGGCGGTGCGGCGGCATCCAGCGCAACTACCAGCACCTGTGCGGCGCTGGGCATCATGCTGCTGGGGCATCGATCTGCTCCGTGGCCGA
GAACCTGTGGGTGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCAGTCCTACAAGA
CCGAGGCCCACAACATCTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGAGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGCCTGAAGCCCTGCGTGAAGCTGACCCCC
CCTGTGCGTGACCCTGAACTGCACCGACGTGAAGCGCAACAACCTCCAACGAGGGCGAGATGAAGAACTGCTCCTTCAACA
TCACCACCGAGATCCGCGACAAGAAGCAGGTGCACGCGCCCCTGTTCTACAAGCTGGACGTGGTGCCCATCGACAACAACACTCCAACACC
TCCTACCGCCTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGACCTTCGAGCCCATCCCCATCCACTACTGCGCCCCC
CGCCGGCTTCGCCATCTGAAGTGCAAGAAGACAAGAAGTTCAACGGCCTCCCTGGCCGAGGAGGAGATCATCCCCGCCCGCGAGAACCTGACCAACAACGCC
TCCGCCCCGTGGTGTCCACCCAGCTGCTCGTGAACGAGTCCGTGACCATCAACTGCACCCGCCCCGGAAACATCCTCGGGCCCCGG
AAGATCATCATCGTGTACACCACCCGCCATCAAGGGCGACATCCGCCAGGCCCATCATCTTCAAGCCCTCCTCCGGCGGCGACCCTGAGTGAACAAGAGACCCTGCAGCAGG
CCAGGCCCCTGTACACCCGCCATCAAGGGCGACATCCGCCAGGCCCATCATCTTCAAGCCCTCCTCCGGCGGCGACCCTGAGTGAACAAGAGACCCTGCAGCAGG
TGGCCAAGAAGCTGGCGAGTTCTTCTACTGCAACATAAAGCCTGTTCAACTCCAACCAGAGTGGAACTCCACCGGCAAGATCAC
AACTGCGGGCGGAGTTCTTCTACTGCAACATCAACATCATCTTCAACTCCAACCAGAGTGGAACTCCACCGGCAAGATCAC
CCTGCCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGGCCGTGGGCAAGGCCATGTACGCCCCCCATCGAGGGCCTGATCAAGTGCT
CCTCCAACATCACCGGCCTCCGAGCTGTACAAGGTGGTGTACAAGTACAAGGTACAAGGTGAAGATCGAGCCCCGGCCCCAAGCGCGTGGTGGA
GCGCGAGAAGCGCGCCGTGGGCATCGGGCCCATCGCCCGGCCCATCGCCCGGCTTCCTGGGCGCCGGCAGCAGCAGGACAAACCTGCTGGGCGCTGCTG
CCGTGCAGGCCTGGGGGCATCAAGCAGCTGCAGGCCCATCCTGGCCGTGGCCGCCAGAACAACCTCCTGCGACGGCAGCAGCAGGACCAGCGTCGGGGCTGCTC
ACCGTGTGGGGGCATCAAGCAGCTGCAGGCCCATCCTGGCCGTGGCCGCCAGAACAACCTCCTGCGACGGCAGCAGCAGGACCAGCGTCGGGGCTGCTC
CGGCAAGCACAATCTGCACCCACCACCCGTGCCCTGGAACTCCTCCGGCCCTGATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGGAAGAACGAGGAGCTG
AGTGGGAGCGCGAGATCGACAAGTGGGCCTCCCTGTGGAACTGGTTCTCCATCACCCAGTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGG
CTGGAGCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCTCCATCACCCAGTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGG
CCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCCCTGGTGAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCCTGCTGCC
CCGCCCCCGGCCGGCGCCCCGACCGAGGGGCGAGCATCGGAGGGGCGAGCAGGGCGGAGCAGAGGCCTGACCTGGTGAACGGCTTC
TCCGCCCCTGATCTGGGACGGCCTGCGGGGCCTGCGCGGCCTGGTTCTCCTACCACCGCCTGCGAGACCTGATCCTGCCGAGTACTGTGGAAGCTGGATCGAGGAGCTGGA
GCTGCTGGACACCACCGCGCTGGCCCATCGCCCGCCCCATCGCCCGGCTGCTGGAGCTGGTGACACCGCGCGTGATCGAGATCGTGGCAGCGCCTGCTGCTGGGAGAACTCCCC
TGTTCGACACCACCGCCTGGCCGGCGGCCACCGGAGGGCCTGGAGCGCGCGGTGATCGAGATCGTGGCAGCGCCTGCTGCTGGGAGAACTCCCC
ACCCGCCATCCGCCAGGGCCTGGAGCGCGCGCGCCCTGCTGCTGTAA

Fig. 49A

2003 CON F1 Env

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MRVRGMQRNWQHLGKWGLLFLGILILICNAAAENLWVTVYYGVPVWKEATTLFCASDAKSYEKEVHNVWATHACVPTDPNPQEVVLGNVTENF
DMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNDTNDNKTGAIQNCSFNMTEVRDKKLKVHALFYKLDIVPISNNNSK
YRLINCNTSTITQACPKVSWDPIPIHYCAPAGYAILKCNDKRFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEDIITRSQNISDNAK
TIIVHLNESVQINCTRPNNNTRKSIHLGPGQAFYATGEIIGDIRKAHCNISGTQWNKTLEQVKAKLKSHFPNKTIKFNSSSGGDLEITMHSF
NCRGEFFYCNTSGLFNDTGSNGTITLPCRIKQIVNMWQEVGRAMYAAPIAGNITCNSNITGLLLTRDGGQNNTETFRPGGGNMKDNWRSELY
KYKVVEIEPLGVAPTKAKRQVVKRERRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQLTVWGIKQL
QARVLAVERYLKDQQLLGLWGCSGKLICTTNVPWNSSWSNKSQDEIWNNMTWMEWEKEISNYSNIIYRLIEESQNQQEKNEQELLALDKWAS
LWNWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRKGYSPLSLQTLIPSPREPDRPEGIEEGGGEQGKDRSVRLVNGFLALVWDDL
RNLCLFSYRHLRDFILIAARIVDRGLRRGWEALKYLGNLTQYWSQELKNSAISLLNTTAIVVAEGTDRVIEALQRAGRAVLNIPRRIRQGLE
RALL$
```

Fig. 50A

2003 CON F2 Env

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MRVREMQRNWQHLGKWGLLFLGILILICNAADNLWVTVYYGVPVWKEATTLFCASDAKAYEREVHNVWATYACVPTDPSPQELVLGNVTENF
NMWKNNMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNVTINTTNVTLGEIKNCSFNITEIKDKKKEYALFYRLDVVPINNSIVYR
LISCNTSTVTQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGLCRNVSTVQCTHGIRPVVSTQLLLNGSLAEEDIIIRSENISDNTKTI
IVQFNRSVEINCTRPNNNTRKSIRIGPGRAFYATGDIIGDIRKAYCNINRTLWNETLKKVAEEFKNHENITVTENPSSGGDLEITTHSFNCR
GEFFYCNTSDLFNNTEVNNTKTITLPCRIRQFVNMWQRVGRAMYAPPIAGQIQCNSNITGLLLTRDGGKNGSETLRPGGGDMRDNWRSELYK
YKVVKIEPLGVAPTKAKRQVQREKRAVGIGAVLLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLKAIEAQQHLLQLTVWGIKQLQ
ARILAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMQWEKEISNYTDTIYRLIEDAQNQQEKNEQDLLALDKWDNL
WSWFTITNWLWYIKIFIMIVGGLIGLRIVFAVLSVVNRVRQGYSPLSLQTLIPNPRGPERPGGIEEGEGEQDRDRSIRLVSGFLALAWDDLR
SLCLFSYRHLRDFILIAARTVDMGLKRGWEALKYLWNLPQYWGQELKNSAISLLDTTAIAVAEGTDRIIEVLQRAGRAVLHIPRRIRQGFER
ALL$
```

Fig. 49B

2003 CON_F1 Env.seq.opt
ATGCGCGTGCGCGGCATGCAGCGCGCAACTGGCCAGCACCTGGCGCAAGTGGGCGCCTGCTGTCCTGGGCATCCTGATCATCTGCAACGCCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGTCCTACGAGA
AGGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACATCATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
GACATGTGGAAGAACAACATGGTGAGCAGATGCTGGAGCAGAGTGCACACCGACATCAACAACGACACAACAAGACAGGCCCTGTTCTACAAGCTGCTCCTCA
CCTGTGCGTGACCCTGAACCTGACAACCGGCCGACCAAGGTGCACGCCCTGGACATCGTGCCCATCCCCCATCCCCATCCCACTACTGCGCCCCCGC
ACATGACCACCGAGGTGCGCGACAAGAAGCTGAAGGTGCACGCCCTGTTCTACAAGCTGTCCTGGGACATGTGTCCTGCAAGAACGTGTCCTGCAAGAACTGTCCACGGCATCA
TACCGCCCTGATCAACTGCAACACCTCCACCATCAACCTCCACCATCAACGTGTCCTGGGACAACGTGTCCTGCAGTGCACCCACGGCATCA
CGGCTACGCCGTGGTGTCCACCCAGTGCACCCCACGCCTTCAACGGCACGGCTCCCTGGAACGTGTCCTGGGAGGAGAACATCTCCGACAACGCCAAG
AGCCCGTGGTGTCCACCCAGCTGCTGCTGCTGCAGCTGCTGCAGCTGAACGCGAGAGTCCGTGCAGATCAACTGCACCCGAGTCCATCCACACCCCGGCCA
ACCATCATCGTGCACCTGAACGAGAGTCCGTGCAGATCAACTGCACCCGAGTCCATCCACACCCCGGCCA
GGCCTTCTACGCCACCGGCGAGATCATCGGCGACATCCGCAAGGCCCACTGCAACATCTCCGGCGCGGCCGACCTGGACCTGGAGCAGG
TGAAGGCCAAGCTGAAGTCCACTTCCCCAACAAGACCATCAAGTTCAACTCCTCCTCCGGCGGCGACCTGGAGATCACCACTCCTTC
AACTGCCGCGGCGAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACGACACCACCCCATCGCCGGCCAACATCACCGGCC
GCAGATCGTGAACATGTGGCAGGAGGTGGGCCGCGCCATGTACGCGCCACCCTTCCGCGGCGTGGCCGACTGTAC
TGCTGCTGACCCCGACGCGGCCAGAACACAACCAGCGCGCTGAGCGGCGACACCCCTGGGGCCGGTGGAGGCCCGTGGGCAT
AAGTACAACGGTGGTGGAGATCGACGCCTGCTGGGAGGCCCCGCCTGGGGCCGGGGGGGACCAGTGGGGCAT
CCGGCCGCCGTGTTCCTGGGCTTCCTGGGCGCGCGCAGCAGCAACCTGCTGCGCGCGCCAGCAGCCATCAAGCAGCTG
CAGGCCCGCCGTGCTGGCCGTGGAGCGCTACCTGAAGGACCAGCAGCTGCTGGGCATCTGGGGCATCTGGGGCATGATCTGCACCACCAA
CGTGCCCTGGAACTCCTCCTGGTCCAACAAGAGTCCCCAGGACGAGAGTCCCCAGGAGAACCAGCAGGAGATCTCCAACT
ACTCCAACATCATCTACCGCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAGAACGAGCAGGAGAGAACGAGCTCCAACT
CTGTGGAACTGGTTCGACATCACTGTGCGCGCGCACATTTCATCATGATCGTGGCCGCCTGATCGGCCTGCGCATCGTGTT
GCCCGTGCTGTCCATCGTGAACCGCGTGCGGCAAGGGCAGCAGGGCGAGCGGCAAGGGCGAGCGGCCTG
CGCAACCTGTGCCTGTTCTCCTACCGCCTGCGCGACTTCATCCTGATCGCCCGCATCGTGGGCAGACCTG
GGCCCTGAAGTACCTGGGCAACCTGACCCAGTACTGGTCCCAGGAGCTGAAGAACTCCGCCGTCTCCCTGCTGGACACCGTGGCCGTGG
TGGCCGAGGCACCGGCGCGTGATCGAGCACCGCCCTGCTCAGCGCCCTGATCAACATCCCCCGCCGCGCTGCTGAACATCCCGCGCCGCCGCGCCGCCTGGAG
CGCGCCCTGCTGTAA

Fig. 50B

2003 CON_F2 Env.seq.opt

ATGGCGGTGCGCGAGATGCGAGCGCGCAACTGGCAGCACCTGGGCAAGTGGGGCCTGCTGTTCCTGGGCCATCATCTGGATCATCTGCAACGCCGCCGA
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTTCTGCGCCCTGTTCTGCGCCGACCCGCCAAGGCCTACGAGC
GCGAGGTGCACAACGTGTGGGCCACCTACGCCTGCGTGCCCACCGACCCCTCCCCCCAGGAGCTGGTGCTGGCAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGACCAGATGCACGAGGACATCATCAACACCAACGTGACCGAGAGCTTCAACA
CCTGTGCGTGACCCTGAACTGCACCGACGTGAACGTGAGAGAAGAAGAAGTACGCCTGTTCTACCGCCTGGTGGTGCCCATCAACAACTGTCTTCAACA
TCACCACCGAGATCAAGGACAAGGAAGAAGAAGAAGTACGCCTGTTCTACCGCCTGGTGGTGCCCATCAACAACTGTCTTCAACA
CTGATCTCCTGCAACACCTCCACCGTGACCCAGGTGTCCTTCGAGCCATCCCATCCCACTACTGCACCCCGCCGCTT
CGCCATCCTGAAGTGCAACGACACAAGAGTTCAACGGCCACCGGCCTCCCCTGGCCGAGGACATCATCAACAACACCAAGACCATC
TGGTGTCCACCCAGCTGCTGCTGAACGGCCTCCCCTGGCCGAGGATCAACTGCAACATCATCAACAACATCAACCGCCGCGCCTT
ATCGTGCAGTTCAACCGCCTCCGTGGAGATCGGCGACATCACCGTGACCTTCAACAACACCTCCGAGATCAACAACACCAAGAGTGGCCG
CTACGCCAGCGGCGACATCATCGGCAAGGCCTTCAACATCACCGTGACCTTCAACAACACCTCCGAGATCAACAACACCAAGAGTGGCCG
AGGAGTTCAAGAACCACCACTTCAACATCATCACCGTGACCTTCAACAACACCTCCGAGATCAACAACACCAAGAGTGACCATCCGGCCA
GGCGAGTTCTTCTACTGCAACACCTCCGAGCTGTTCAACAACACCTGGTTCAACAACACCTCCGAGCTGCAACTCCGGCCTGC
GTTCGTGAACATGTGGCAGCCCGTGGGCCGCGCCATGTACGCCCCCATCTCCGAGACCCTGGGCGGCGACAACTGGCGCTGTACAAG
TGCTGACCCGCGACGGCGGCAAGAACGGCTCCGGCGTGGCCCCGCCTCCCACCATGGGCGTGGCCATCTGGGGCATCGG
TACAAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCGCCTCCACCATGGGCGTGGCCATCTGTGGGCATCGG
CGCCGTGCTGCTGGGCTTCCTGGGCGCCGCCGGGAGGCCCAGCTGCTGGGGCATCAAGCAGCTGCAG
GCATCGTGCAGCAGCAGTCCAACCTGCTGCAGGCCATCGAGGCCCAGCAGCTGCTGGGGCATCAAGCAGCTGCAG
GCCCTGACCGTGTGGGGCATCATCCTGGTCCAACAAGTCCCAGAAGGACCGCCAGAGATCCCAGAACCAGCAGAGATCTCCAACTACA
CCGACACCATCTACCGCCTGATCGAGGACGCCCAGAACCAGCAGAGAAGGAGAACCAGCAAGTGGGACAAACCTG
TGGTCCTGGTTCACCATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGTGTTCGC
CGTGCTGCGTGTGGTGAACCGCGTGCGCCAGGGCTACAGCCCGCTCCGTGGTCCGCCGCCGCCGCGGCCGCCCGGCCGCCCTGCGCC
GCGGCATCGAGGAGGAGGGCGAGCAGCAGGCCGAGGCCCTGCGCCTCTGGTGTCCGCCACCGTGGGCGGCGGCGACCTGCGCC
TCCCTGGCCGTGTTCTCCTGGAACCTGCGCGACCTTCATCCTGGCCGTGTACCGCGCCGTGCGGGGCCTGGAAGCGCGGCCTGGGAGGC
CCTGAAGTACCTGTGGAACCTGCCCCAGTACTGGGGCCAGCTGCTGAACCTGCGCCCTCCTGCGGACACCGCCGCCATCCGCCGTGG
CCGAGGGCACCGACCGCATCATCGAGGTGCTGCAACCGCGCCATCCGCCGCGCCGTGCTGCACATCCCCCGCCGCATCCGCGAGCGC
GCCCTGCTGTAA

Fig. 51A

2003 CON G Env

MRVKGIQRNWQHLWKWGTLILGLVIICSASNNLWVTVYYGVPVWEDADTTLFCASDAKAYSTERHNVWATHACVPTDPNPQEITLENVTENF
NMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNVTNNNTNNTKKEIKNCSFNITTEIRDKKKKEYALFYRLDVVPINDNGNSS
IYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIIRSENITDNT
KVIIVQLNETIEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTKWNEMLQKVKAQLKKIFNKSITFNSSSGGDLEITTHSF
NCRGEFFYCNTSGLFNNSLLNSTNSTITLPCKIKQIVRMWQRVGQAMYAPPIAGNITCRSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRS
ELYKYKIVKIKPLGVAPTRARRRVVEREKRAVGLGAVLLGELGAAGSTMGAASITLTVQVRQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGI
KQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSNKSYNEIWDNMTWIEWEREISNYTQQIYSLIEESQNQQEKNEQDLLALDK
WASLWNWFDITKWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLTHHQREPDRPERIEEGGGEQDKDRSIRLVSGFLALAW
DDLRSLCLFSYHRLRDFILIAARTVELLGRSSLKGLRLGWEGLKYLWNLLLYWGQELKNSAINLLDTIAIAVANWTDRVIEVAQRACRAILN
IPRRIRQGLERALL$

Fig. 52A

2003 CON H Env

TRVMETQRNYPSLWRWGTLILGMLLICSAAGNLWVTVYYGVPVWKEAKTTLFCASDAKAYETEKHNVWATHACVPTDPNPQEMVLENVTENF
NMWENDMVEQMHTDIISLWDQSLKPCVKLTPLCVTLDCSNVNTTNATNSRFNMQEELTNCSFNVTTVIRDKQQKVHALFYRLDVVPIDDNNS
YQYRLINCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNNKTFNGTGPCTNVSTVQCTHGIRPVVSTQLLNGSLAEEQVIIRSKNISDN
TKNIIVQLNKPVEITCTRPNNNTRKSIHLGPGQAFYATGDIIGDIRQAHCNISGKKWNKTLHQVVTQLGKYFDNRTIIFKPHSGGDMEVTTH
SFNCRGEFFYCNTSGLFNSSWTNSTNDTKNIITLPCRIKQIVNMWQRVGQAMYAPPIKGNITCVSNITGLILTFDEGNNTVTFRPGGGDMRD
NWRSELYKYKVVKIEPLGVAPTEARRRVVEREKRAVGMGAFFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIQAQQHMLQLT
VWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSLDEIWDNMTWMEWDKQINNYTEEIYRLLEVSQTQQEKNEQDLL
ALDKWASLWNWFSITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDRPEGIEEEGGEQDRDRSVRLVNGFL
PLVWDDLRSLCLFSYRLLRDLLLIVVRTVELLGRRGREALKYLWNLLQYWGQELKNSAINLLNTTALAVAEGTDRIIEIVQRAWRAILHIPR
RIRQGFERTLL$

Fig. 51B

2003 CON_G Env.seq.opt

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ATGGCGGTGAAGGGCATCCAGCGCCAACTGGCAGCACCTGTGAAGTGGGCACCCTGATCCTGCTGGTGATCATCTGCTCCGCCTCCAA
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGGGAGGACGGCCGACACCACCCTGTTCTGCGCCTCCAAGGCCTACTCCA
CCGAGCGCCACAACGTGTGGGCCACCACGCCTGCGTGCCACCGACATCATCTCCCCAGGAGATCACCCTGGGGACAACGTGACCGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACGAGTCCCTGCGTGAAGCCGTGAAGCTGACCCC
CCTGTGTGCGGCTGACCCTGCAGGATCCCGGACGACGTGACCGAACCTGAACAACAACACCAGCAAGAAGGAGATCAAGAACTGCTCCTTCAACA
TCACCACCGAGATCCGGCACGACAAGAAGAAGGAGTACGCCCTGTTCTACCGCCTGGTGCCCATCAACCCCATCCCATCCACTACTGCGCCCTCC
ATCTACCGCCCTGATCAACTGCAACCTCCTGCCACCATCAAGCAGGCCTGCCCCAAGGTGACCTTCGACCCCATCAACGGCACGTGGCACCACGGCA
CGCCGGCTTCGCCCATCCTGGTGTTCCACCCAGTGCTGCTGAACGGCTCCCCTGGCCGCCACACTGCACACCGGACAACAACACC
TCAAGCCCGTGGTGTTCAAGCAGAGCTGCTGCTGAACGGCGATCATCATCCGCTCCGAGAACATCATCCGCTCCGAGAACATCATCCGCCCCGG
AAGGTGATCATCGTGCAGCTGAACGAGACCATCGAGATCAACTGCACCCGCCCGAACTGCCAAGTCCATCCGCGCCCACCGAGAGTGCTGCAGA
CCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCTTCAACAAGTCCATCACCTTCAACAACTCCCTGCTGAACAACTCACCCTGCCCTG
AGGTGAAGGCCCAGCTGAAGAGATCTTCAACAAGATCTTCAACAACACCTCCGGCGGACCTGGAGATCACCCATCACCCTGCCGCTCCAACA
AACTGCCGCGCGGAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACGGCCGCGTGGGCAGCCGCGCAGCTGGAGGGCAGCAACACCTGGGCTCC
CAAGATCAAGCAGATCGTGCGCATGTGCAGGGCCAATGTACGCCCCCCCCCGGGGGCCGCCGGCCGCAACTGGCCTCC
TCACCGGCCTGCTCTGTGCCGACCCGGACGGCGGCAACAACACCGACCTTCCGCCCCCACCCGGGCCGGGGCCGGAAGCGCGCC
GAGCTGTACAAGTACACAAGATCGTGAAGATCAAGCCCCTGGGCGCTGCTGCAGCGACGTGGGCGGCTTCCTGGGGCCGCGGAAGGCGCC
CGTGGGGCCTGGGGCCGTCTGGGCGTGCTGCAGCAGCCCGTGCTGCCCGTGGAACATCGAGGGCCCATCTGGGGGCATGGTGTGGGGCATC
AGCAGCTGCAGCTGCGTGTGGCCCGCGCGCCTGGCCGTGGCCGTGCTGGGCGTACCTGGAAGCTGGAGGCGCGAGA
AAGCAGCTGCAGCCCCGCGCTGCCCTGGAAACGTGCCCTGGAAGTCCAACCAAGTGGGAGACCAGGAACGACCTGCCCTGGACAAG
CACCACCAACGTGCCCTGGAACTGGAGCAGTGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGCG
TCTCCAACTACACCACCCAGCAGAGATCTACTACTCCCTGATCCACAGCCTGATCGAGGAGAGCCAGAACCAGCAGGAGAAGAACGAGCAGGAGCTGCTGGACAAG
TGGGCCTCCCTGTGGAACTGGTTCGACATCAGCAACTGGCTGTGGTACATCAAGCTGTTCATCATGATCGTGGGCGGCCTGATCGGCCTGAGGC
CATCGTGTTCGCCGTGCTCAGCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCCCTGAGCTTCCAGACCCTGCTGCCCGCCCCCAGAGAGCTGCGAGC
CCGACCGCGCCGAGCGCGATCGAGGGCGAGGGCGAGAGCGGCGGCGACAGGGACGGCGGCGGCGACAGGGACCGGCGGCGGCGACTGG
GACGACCTGCGCTCTGCCGCTGTGTCCTGTTCTCTGCGGGCGGACCTGCGGGCGGCGACTTCATCCTGATCGTGCTGCGTGTGCTGCGTGGGCCGCGCTC
CTCCCTGAAGGGCCTGCAGCGCCTGGGCGAGGCCTGGGCCCGTGGGGCCTGTTGCTGTAGTACTGGTTCGTGCTGGAGCTGGAAGAACTCCCGCCA
TCAACCTGCTGCTGGACACCATCGCCGTGGCCAACGCCGTGGATCGAGGGCGTGATCGAGGACCGCGGCAACGCGCCTGATCCTGAAC
ATCCCCCGCCGCATCCGCGCCAGGGCCCTGGAGCGCGCCCTGCTGTAA
```

Fig. 52B

2003 CON_H Env.seq.opt

ACCCGCGTGATGGAGACCCAGCGCAACTACCCCTCCCTGTGGCGCTGGGCACCCTGATCCTGCTGGGCATGCTGCTCCGCCGCCGG
CAACCTGTGGGTGACCGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAAGACCACCCTGTTCTGCGCCTCGACGCCAAGGCCTACGAGA
CCGAGAAGCACAACGTGTGGGCCACCCACGCCTGGGCCACCCAACCCCAGGAGACCCCAGGAGCCCTGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGGAGAACGACAATGTGGAGCAGATGCACACCGACATCAGCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCGATGATCCGGCGAACGTGAACAACGCCACCAACTCCCCTGTTCTGACCGCGGTGGTGCCCATGACGAACAACTCC
TCAACGTGACGAGCCGTGATCCGCGACAGGAAGGTGCACGCGCCCGTGTTCTGCCCCCAGGCCTGCCCCAAGGTGTCCTTCGACCCCATCCCCATCACTACTGCGC
TACCAGTACCGCCCGCTGATCAACTGCAACACCTCCGTGATCAACAAGACCTTCAACGGCACCACCCAGCCCTGCCCCAACGTGTCCACCGTGCAGTGCACCCACG
CCCCGCGGCTTCGCCACCCTGGGTGTTCTGCCCATCCTGCTGCTGAACGGCTCCCCTGCTGGAGGAGCCCCCAACAACAACACCCCGAGTCCATCCACCTGGGCCCC
GCATCCGACCGCGCTGGTGTGTCCAGCTGCTGCTGAACGGTGATCATCGCGCCGGAGGCCGGCAGGCAGGTGATCATCGTCCGCTCAAGAACAATCTCCGACAAC
ACCAAGAACAATCATCGTGCAGCTGAAGCAAGCCCGTGGAGATCACCTGCACCCGCCATCCATCCCAAGTCCATCCACCTGGGCCC
CGGCCCCAGGCCTTCTACGCCGACATCATCGGCGACATCATCGGCGACATCTCCGGCAAGAAGTGGAACAAGACCCTGC
ACCAGGTGGTGACCCAGCTGGGCAAGTACTTCGACAACCGCACCTCCCACTCCGACCTCCTCTTCAAGCCCTGCGTGTTCAACTGCACCTCCTCGGACCTGCTGAGCTGAGGTGACCACCCAC
TCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCAACACCTCCGGCCTTCAAGCCCTGCGTGTTCAACTGCACCTCCTCCGGACCTCCTCTGTTCAACCCCGTGTTCAACTGCACCTCCAAGAACAT
CATCACCCTGCCCTGCCGCATCAAGCAGATCGTGAACATGTGGCAGCGCGTGGGCAAACATGTGGCAGCGCGTGGGCGGCCATCAAGCGCGAC
CCTGCGTGTCCAACATCATCGGCGACATCAGCGCCTGATCCTGAGCGGCAACAACACCGTGACCTTCCGCCCGGCCGGCACATGCCGGAC
AACTGGCGCTCCGAGCTGTACAAGTACGCCAGGTGGTGGTCAAGATCGGTGAAGATCGAAGATCGAGAGCCCCGTGGGCTCCGGCGTGGTGGAGCG
CGAGAAGCGCGGCCGCCGCCAGCTGCGGTGGGCATGGGCGCCTTCTTCCTGGGCGCATGGGCGCCAGCGTGCTCCGGCATCGTGTCCGGCGCTTCCTG
TGCAGGCCCGCCGCCAGCTGCTGTCCGCTGTCGTGCAGCAGCAGTCCAACCTGCTGCGCGCCATCGAGGCGCCCATCCAGCAGACCAGCAGCTGCTGGGCGTGACC
GTGTGGGGCATCAAGCAGCTGCAGGCCCGGTGCTGCAGCCCGCCATCCAGCAGCTGCTGGGGCGTGACCCTGCTGCTCCGG
CAAGCTGATCTGCACCACCAACGTGCCCTGGAACTCCCTGTGGAACTGGTTCTCCAACATCAAGGAGACCCCGCAGAATCTGGACAACATGACCTGGATGGAGT
GGGACAAGCAGCAGATCAACAACTACACCAGTATCTACAGGCTGCTGGAGGACGCCCAGCTCCCAGAGAGAACGAGCAGGACCTGCTG
GCCCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCTCCATCATCGTGCAGCTGCCCCTGCGTACCCTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCT
GATCGGCCTGCGCATCATCTTCGCCGTGCTGTCCATCGTGAACCGCGCCCCGCGCGGGCTCCTGCGCCTGGGCGCCTGCGTGAACGGCTTCCTG
CCCCTGGTGTGGGACGACCTGCGCTCCCTGTGCCTGTTCCTGTCCTACCGCCTGGCTGCGCGACCTGCTGGGCTACTGGGGCCAGGAGCTGAAGAACCTGGAGCT
GCTGGGCGCCGCGCGGCCCGGCCATCCGCCGAGGGCCCATCGGCCATCAACCGCGCCGGGCGCGCCGCCATCCCTGCGCACATCCCCCGC
CGCATCCCGCCCCAGGGCTTCGAGCGCGGCGCACCCCTGCTGTAA

Fig. 53A

2003_CON_01_AE Env

MRVKETQMNWPNLWKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHLENVTENF
NMWKNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNVNNITNVSNIIGNITNEVRNCSFNMTELRDKKQKVHALFYKLDIVQ
IEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVVSTQLLLNGSLAEEEIIIRSEN
LTNNAKTIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEVLKQVTEKLKEHFNNKTIIFQPPSGGDLE
ITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIILPCKIKQIINMWQGAGQAMYAPPISGRINCVSNITGILLTRDGGANNTNETFR
PGGGNIKDNWRSELYKYKVVQIEPLGIAPTRAKRRVVEREKRAVGIGAMIFGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEA
QQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKLICTTAVPWNSTWSNRSFEEIWNNMTWIEWEREISNYTNQIYEILTESQNQQ
DRNEKDLLELDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTPTHHQREPDRPERIEGGGEQGRDRS
VRLVSGFLALAWDDLRSLCLFSYHRLRDFLLIAARTVELLGHSSLKGLRRGWEGLKYLGNLLLYWGQELKISAISLLDATAIAVAGWTDRVI
EVAQGAWRAILHIPRRIRQGLERALL$

Fig. 54A

2003_CON_02_AG Env

MRVMGIQKNYPLLWRWGMIIFWIMIICNAENLWVTVYYGVPVWRDAETTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIHLENVTENEN
MWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLDCHNNITNSNTTNNNAGEIKNCSFNMTELRDKKQKVYALFYRLDVVQINKNNSQYR
LINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIVIRSENITNNAKTI
IVQLVKPVKINCTRPNNNTRKSVRIGPGQTFYATGDIIGDIRQAHCNVSRTKWNNTLQQVATQLRKYFNKTIIFANPSGGDLEITTHSFNCG
GEFFYCNTSELFNSTWNSTWNNTEKCITLQCRIKQIVNMWQKVGQAMYAPPIQGVIRCESNITGLLLTRDGGNNNSTNETFRPGGGDMRDNW
RSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTVW
GIKQLQARVLALERYLKDQQLLGIWGCSGKLICTTTVPWNSSWSNKTYNDIWDNMTWLQWDKEISNYTDIIYNLIEESQNQQEKNEQDLLAL
DKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLTIINRVRQGYSPLSFQTLTHHQREPDRPERIEGGGEQDRDRSVRLVSGFLAL
AWDDLRSLCLFSYHRLRDFVLIAARTVELLGHSSLKGLRLRGWEALKYLGNLLSYWGQELKNSAINLLDTIAIAVANWTDRVIEIGQRAGRAI
LNIPRRIRQGLERALL$

Fig. 53B

2003 CON_01_AE Env.seq.opt

ATGCGCGTGAAGGAGACCCAGATGAACTGGCCCAACCTGTGGAAGTGGGGCACCCTGATCCTGGGCCTGGTGATCATCTGCTCCGCCCTCCGA
CAACCTGTGGGTGACCGTGTACGGCGGTGCCCGTGTGGCGCGACGCCCACCACCCCGTTCTGCGCCCTGGAGAGATCCAACCCCCAGGAGAACTTGACCGAGAACTTC
CCGAGGTGCACAACGTGTGGGCCACCCAGGATGCAGGAGCAGTCGGACCAACGCCCAAGGTGCCCGTGAGTGCCAACATCACCAACGTGCCCAACG
AACATGTGGAAGAACAACATGTGGAAGAACAACATGGAAGCTGAACCTGACCCTGACCCTGTGGACCAACGTGCCAACGTGCCCAACGTGCCGTGAACATCACCAACG
CCTGTGCGTCGTGACCCTGACCCTGACCCTGTCAACAACATCACCAACGTGCCAACGTGCCGCCCTGTTCTACAAGCTGGACATCGTGCAG
AGGTGCCAACTGCTCCTTCAACATGACCAACATGCCCGGCCAGAAGAGCTGCAACAACACTCGTGATCAACTGCTGATCAACTGCTGATCAACACTCCTTCGTGACCCCCATCCCCAT
ATCGAGGACAACAACTCTACCGCCGGCTACGCCCTGATCAACTCCGTGATCAAGCACCTTCCTTCGACCCATCCCCGTCCCAT
CCACTACTGCACCCCCGCCGGCTACGCCCTGACGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCGTGAACGTGTCCTCGTGC
AGTGCACCCACGGCATCAAGCCCGGCATCAAGAGCCATCATCAACGCCCAACAACCATCCCGCACCTCCAT
CTGACCAACAACGCCAAGACCATCATCGTCGTGACCATGCGCTGCCAACAAGTCCGTGAGATCAACAAGTCCGTGAGATCCTGCACCCTGAAC
CACCATCGGCGGCCGTGTTCTACCGCCGTGTTCTACCGCGCCGACATCCGCAACGCCTGCCAACGCCGTGAGATCAACGGCCACCAAGTGGA
ACGAGGTGCTGAAGCAGTGACCGAGGTGCTGAAGCAGTGACCGAGAAGCTGAACAACAAGACCACTCTTCAACAACAACACTGCGCCCCCTCCGGCGGCGACCTGGAG
ATCAACCATGCACCACTTCAACTGCGCCGAGTTCTTCAACTGCGCCGAGTTCTTCTACTGCAACAAGATCAACATGTGGCAGGGCGGCGCCAACAACTGCGCCCCCC
GGAGGGCTGCAACGCCACCATCATCTGCCCCTGCAAGATCAAGCAGATCATCAACATGTGGCAGGGCGGCGGCCAGCCATGTACGCCCCCC
CCATCTCCGGCGGCGGCAACAACTCGTGATCAACATCTGCAACAACTGGGCCCCTGGGCCATCGAGCCCTGGGCATCGAGCCCCACCCG
CGCCAAGCGCCCAGGTGCAGGTGGGCGGAGAGCGCCCGCCCAGGCCCGTGTCCGGCTCCAACCTGCTGCCGCCATGGCC
GCGCCCTCCATCACCCCTGACCCTGCTGCAGCGTGACCGTGTGGGCATCAAGCAGCTGCAGGCCGTGCTGACCTACCTGAAGGACCAGAAGTT
CAGCAGCACCTGGGGCCTGGGGCCTGTGTGGGGCATCAAGAGCGCCAAGATCATCTGCACCGCCGTGCCTTCGTCCTTCGGAGGAGATCT
CCTGGGCCTGTGGGGCTGCTGCCTGGGGCCTGGATCGAGTGGGAGCGCGAACATCTGCACCTGGAACTGGTTCGACATCGTGGTTCATCAAGAT
GGAACAACATGACCTGGATCGAGTGGGAGCGCGAGATCTCCAACTACAACGATCTACAGGTTCAACTGGTTCGACATCGTGGTTCATCAAGAT
GACCGGCAACGAGAAGGACCTGCTGGAGCTGGATAGGGCTGGAACTGTTCGACATGGGCTGTGGTACATCAAGGAT
CTTCATCATGATCGTGGGCGGCCTGATCGGCCTGAGAGCGCCCCACCCGCTGCCATCGTTCGCGCCCGAGCCGCGCGAGGGCCGACCGCTCC
TGTCCTTCCAGACCCCCACCCACCACCACCACCGTCCCGCCTGGCCTTCCTGGCCTGGGAAGGGCCTGGGAGCTGGGAGGGCTGGGAGCTGGGAACCTGGGCAACCTGC
GTGCGCGCCTGGTGTCCGCCGTGTCCGCCGTGGTGCCGCCCTGGCCGCCTGCCACCGTGTGCGCGCCCCACCGCCGCGACTTCATCCT
GATCGCGCCTCCATCACCCTGGGCCTGCTGGGCGCTGCTCCCTCCCTGAAAGGGCTGGACGCCACCATCCCGCCGCCCCACCTGC
TGCTGTACTGGGGGGGCCTGCTGGGGGGCTGCTGGGGGCTGCTGAAGATCTGAAGATCTGAACCGCCGTGACCGCGACCGCGTGATC
GAGGTGGCCCAGGGCGCCCTGGCCCTGGGCCGCATCCCGCCCATCCTGCACATCCTGCACATCCCCGCCGGCCGCATCCGCCTGGGAGCGCGACCGCGTGCTGTAA

Fig. 54B

2003 CON_02_AG_Env.seq.opt

ATGCGCGTGATGGGCATCCAGAAGAACTACCCCCTGCTGTGCGCTGGGCATGATCATCTTCTGGATCATGATCATCTGCAACGCCGAGAA
CCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGCGCGACGCCGAGACCACCACCCCCCAGGAGATCCACCTGGAGAACGTGACCGAGAACTTCAAC
AGGTGCACAACGTGTGGGCCACCCACGCCCTGCGCGTGCCCGACCCCAACCCCCTGTCCCTGTGGGACAACAACATCATCATCAACAACACCACCAAC
ATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTCCCTGCGTGGGAAGCTGACCCCCT
GTGTCGGTGACCCTGGACTGCCACAACAACAACTCCAACACCAGGCCGGCGGAGATCAAGAACTGCTCCTTCAACATGA
CCACCGAGCTGCGCGACAAGAAGCAGAAGGTGTACGCCCTGCCCCTGCGCTGGTGCAGATCCCCATCCCAGTACCGC
CTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCTGCCCAAGGTGTCCTTCGAGCCCATCCCCAACTACTGCGCCCCGGCTT
CGCCATCCTGAAGTGCAACGACACAAGGAGTTCAACGGCACCGGCCTGCTGCTGACCCGCGGAGGAGATCCAGGCCCACCGGCATCAAGCCCG
TGGTGTCCACCCAGCTGCTGCTGAACGGCCTCCCTGGCCGAGGAGATCGTGATCCGCTCCGAGAACATCACCAACAACGCCAAGACCATC
ATCGTGCAGCTGGTGAAGCCCGTGAAGATCAACTGCACCCGCCCAGAGTCCGTGCCCGCCACCAAGTGGAACCAGTTAAAACCCTGCAGCCTT
CTACGCCACCGGCGACATCATCGGCGACATCCTGCAGCCCAACCCCTGTCCCGGCGGCGACCCTGGAGATCCAACACCAGCCCAGCCTGGCCA
CCAGCTGCCAAGTACTTCAACAAGACCATCTTCGCCAACTCCAACCCCGGCGAAGTGCATCACCCTGCAGTG
GGCGAGTTCTTCTACTGCAACACCTCCGAGCTGTTCAACTCCAACCCCATCCAGGGCCATGGGGCCGCGATCGTGATCCGCTCCAGTCG
CCGCATCAAGCAGATCGTGACCCGCTGCTGACCCGCCAACATGTGGCAGAAGGTGGCAACAACAACTCCACCAACGCCGCGACAACTGG
TCACCGGCCCTGCTGCCCGAGCTGTACAAGTGGTGAAGATCGAGCCCCGTGGGCGCCGCCGCCAAGCCCGTGGTGGAGCGCGAGAA
CGCTCCGAGCTGTACAAGGTGACAAGGTGCCCGGCTTCCTGGGCGCCGCCGCCAGCAGTCCAACCTGCTGGGGGCTGCCAGG
GCGCGCCGTGGGCGCCGTGTTCCTGGGCGTTCCTGGGCGCTTCCTGGGCCTGTGTCCGGCATCGTGCGCCGTCCAGCGCCTGCTGGCCCGTGTGG
CCCGCCAGCTGCTGTCCGGCATCGTGCGCCGCCGGCCTTGGCCGTGCCCTGGAGCTGCCAACCTGCTGGGGCGTGTG
GGCATCAAGCAGCTGCAGGACCAGCTGCTGGGCGTGTGGGGCATCAAGCAGCTGCAACTGTCCGGCCTGGGCATCGTGCGCCAAGCT
GATCTGCACCACCGCCGTGCCCTGGAACTCCTGGAGCAACCTGGACAACAAGCAGCCACTACACCTGCTGCTGCAGTGGGGACA
AGGAGATCTCCAACTACACCACCGACATCATCTACAAGCTGATCGAGGAGAGTCCCAGAGAAAGCAGCAGGAAGACCTGCTGGCCCTG
GACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGG
CCTGCGCATCGTGTTCGCCGTGCTGAGCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCGTGCTCCTTCCAGGCCCTGCTGCCCCTG
GCGAGCGCCCCCGGGCGGCCATCGAGGAGGGCGGCGACGCCGCGACCTGCGCCGGACTTCGTGCTCGGCCACCGCGCCCAGGAGACTGCTGGG
GCCTGGGACGACCTGCGCCTCCCTGTGCCTGTTCTCTACCACCGCGCCTGCTGCGGGGAGGCCCTGGGCGCCCATCGCGGCCAACCTGCTGGGGG
CCACTCCTCCCTGAAGGGCCTGCGCCTGGGCGGGCCTGCGGCGCCCCCATCGCCGACCGGCCTCGTCCCTGCTCCTGCTGCTGGCCAGAGAACT
CCGGCCAACCTGCTGCTGCCTGGCCGCGCTGCAACCTGGACCGCGTGATCGAGAGTCGGCCGACGGATCGGCCGCGCCGCCATC
CTGAACACATCCCCCCGAGACATCCCCGCCATCCGGGCCTGGAGCGCCTGGGAGCTGCTGGG
CTGAACATCCCCCGCGACGCCTGGCCATCCCGGCCTGGAGCGCCTGGGAGCTGCTGGGG

Fig. 55A

2003 CON_03_AB Env

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MRVKEIRKHLWRWGTLFLGMLMICSATENLWVTVYYGVPVWKEATTLFCASDAKAYSKEVHNVWATYACVPTDPSPQEIPLENVTENFMG
KNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLKKNVTSNTSSIKMEMKNCSFNITTDLRDKVKKEYALFYKLDVVQIDNDSYRL
ISCNTSVVTQACPKISFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVVIRSVNFTDNTKTII
VQLKEPVEINCTRPNNNTRKGIHIGPGRAFYATGDIIGDIRQAHCNISITKWNNTLKQIVIKLRKQFGNKTIVFNQSSGGDPEIVMHSFNCG
GEFFYCNTTKLFNSTWNGTEELNNTEGDIVTLPCRIKQIINMWQEVGKAMYAPPIAGQIRCSSNITGLLLTRDGGNSNVTEIERPGGGDMR
DNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQL
TVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPWNTSWSNKSLDEIWNNMTWMEWEREINNYTGLIYNLIEESQNQQEKNEQEI
LALDKWASLWNWFDISKWLWYIKIFIMIVGGLVGLRIIFAVLSIVNRVRQGYSPLSFQTRLPTQRGPDRPEGIEEGGERDRDTSIRLVNGF
LALIWDDLRSLCLFIYHHLRDLLLIAARIVELLGRRGWEALKYWWNLLQYWIQELKSSAINLIDTIAIAVAGWTDRVIEIGQRFCRAIRNIP
RRIRQGAEKALQS
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Fig. 56A

2003 CON_04_CPX Env

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MRVMGIQRNYPHLWEWGTLILGLVIIICSASKNLWVTVYYGVPVWRDAETTPFCASDAKAYDKEVHNIWATHACVPTDPNPQEIALKNVTENF
NMWKNNMVEQMHEDIISLWDEGLKPCVKLTPLCVALNCSNATINNSTKTNSTEEIKNCSFNITTEIRDKRKKEYALFYRLDIVPINDSANNN
SINSEYMLINCNASTIKQACPKVTFEPIPIHYCAPAGFAILKCNDKNFTGLGPCTNVSSVQCTHGIKPVVSTQLLLNGSLATEGVVIRSKNF
TDNTKNIIVQLAKAVKINCTRPNNNTRKSVHIGPGQTWYATGEIIGDIRQAHCNISGNDWNETLQKIVEELRKHFPNKTIIFAPSAGGDLEI
TTHSFNCGGEFFYCNTSELFNSTYMNSTNSTTINKTITLPCRIKQIVSMWQEVGQAMYAPPIAGSINCSSDITGIILTRDGGNNTNNETFR
PGGGDMRDNWRSELYKYKVVKIEPVGVAPTRARRRVVQREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEA
QQHLLRLTVWGIKQLQARVLALESYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSYNDIWDNMTWLQWDKEINNYTQIIYELLEESQNQQ
EKNEQDLLALDKWANLWNWFNISNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSLQTLIPTQRGPDRPEGTEEEGGEQDRSR
SIRLVNGFLPLIWDDLRNLCLFSYRHLRNLLLIVARTVELLGIRGWEALKYLWNLLLYWGQELRNSAINLLDTTAIAVAEGTDRIIEAVQRA
CRAIRNIPRRIRQGLERALLS
```

Fig. 55B

2003 CON_03_AB Env.seq.opt

ATGCGCGTGAAGGAGAGATCCGCAAGCACCCTGTGGGCGCTGGGGCACCCTGTTCCTGGGCATGCTGCTGATGATCTGCTCCGCCACCGAGAACCTGTG
GGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCGCCAAGGCCTACTCCAAGGAGGTGC
ACAACGTGTGGGCCACCTACGCCTGCGTGCCCACCGACCCCTCCCCCCCAGGAGATCCCCCTGTGGGACCAGTCCTGAAGCTGACCCCCCTGTGCGT
AAGAACAACATGGTGGAGCAGATGCACGAGGAACATCATCTCCCTGCCACCAACACCTCCACCAACACTGTCCTTCAACATGGGC
GACCCTGAACTGCACCGACCTGAAGAAGAACGTGACCTTCAAGATGAGGAGATGATGAAGAACTGCTCCTTCAACA
TCACCACCGACCTGCCGCGACAAGGTGAAGAAGGAGTACGCCCTGTTCTACAAGCTGGACGTGGTGCAGATCCCCATCCCCCTGGTTCGC
ATCTCCTGCAACACACCTCCGTGGTGACCCAGAGAGTTCAACGGCACCGGATCTCCTTCGAGCCCATCCCCGCCCGGCTTCGC
CATCCTGAAGTGCAACGACAACAAGAAGTTCAACGGCACCGGATCTCCTGCAACGTGTCCCACCGTGTCCAGTGCATCAAGCCCGTGG
TGTCCAGCTGAAGGAGCCCGTGGAGATCAACCCGCGCCCCAACAACAACACCCGCGCCCTTCTA
CGCCACCGGCGACATCATCGGCGACAAGATCGTGTTCAACCAGTCCTCCGGCGGCACCGACCCCGAGAGTGGAACAACACCTGAAGCAGATCGTGATCA
AGCTGCGCAAGCAGTTCGGCAACAAGACCATCGTGTTCAACCACCAGTCCTCCGGCGGCACGAGCTGATGCACTCCTTCAACTGCGGC
GGCGAGTTCTTCTACTGCAACAGCACCACCCAAGCTGTTCAACTCCACCTGGAACGGCAGGAGGTGGGCAAGCCCATGGTGACACCGAGGGCCGACATCGTGAC
CCTGCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGGAGGTGGGCAAGGCAATGGGCAGAGGGCGGCGACATGCGC
CCTCCAACATCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACAGTCAACAGTGGTGAAGATCGAGCCCGTGGTCA
GCGCGAGAAGCGCCGCCAGCTGCGCGGCAGCGCCCGCCAGCTGCTGGGCGCCCTCCATCACCCTGA
CCGTGCAGGCCCTGTCCGGCATCGGTGTTCCTGGGCTTCCTGGGCGCAGCAGAACAACCTGCTGGAACAACATGACCTGGATGG
ACCGTGTGGGGCATCAAGCAGCTGCAAGGCCGCTGGGCGGCCCATCGAGGCCATGAACATGGAACAACATGACCTGGATGG
CGGCAAGCTGATCTGCACCACCGCCGTGCCCTGGAACAACTACACCGGCCTGATCTACAACCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGATC
AGTGGGAGCGCGAGATCAACAACTACACCGGCCTGATCTACAACCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGATC
CTGGCCCTGGACAAGTGGGCCGCCATCATCTTCGCCGGCCTCATCGTGTGTCCCTGTGGTGGTACATCAAGATCTTCATCATGATCGTGGGCGG
CCTGGTGGGCCTGCGCATCGTCTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGGCAGGGCTACAGCCCGCTGTC
CCACCCCAGCGCCCGCGACCCCGACCGGAGCGAGAGCGACGACGCGCGCCCGCAGCACCTGTCCATCCGCCCGCCATCCGCGC
CTGGCCCCTGATCTGGGACGACCTGCGCTCCCTGTGCCTGTTCATCTACCACCGCCTGCGCGACCTGCTGCTGATCGTGACCAGGCTGGGTGGA
GCTGCTGGGCCGCCGCGGCTGGGAGGCCCTGGGCGGCCGCTGGGCCGTGGAGCTGGGCCGCCTGGGCCGTGGAGCTGGGCCGTGGAGCTGGGCCGTGGAGCTGGGCCGTGGAGCTGGGCCGTGGAGCTGGGCCGTGGAG
TGATCGACACACCATTGCGCCGCGCCATCCGCGCCATCCTGCACATCCCCGCCGCATCCGCCGCCAACATCCCC
CGCCGCCATCCGCCCAGGCGGCCGCGAGAAGGCCCTGCAGTAA

Fig. 56B

2003_CON_04_CPX_Env.seq.opt

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ATGCGCGTGATGGCATCCAGCGCAACTACCCCCACCTGTGGGAGTGGGCACCCTGATCCTGGGCCTGGTGATCATCTGCTCCGCCTCCAA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGCGCGGCGAGCGGCACACCCTTCTGCGCCTGGCCGAGAACTTC
AGGAGGTGCACAACATCTGGGCCACCCACGCCTGCGTGCCCACCGACCCCCCAGGAGATCGCCCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCACCAGACCAACTCCACCAAGAGACCAACTCCAACAACAAC
CCTGTGTGCCTGGCCCTGAACTGCTCCAAGCCACCATCAACAACTCCACCAAGAGACCAACTCCACCAAGAACTGCTCCTTCAACA
TCACCACCGAGATCCGGACAAGAAGAAGAAGGAGTACGCCCTGTTCTACCGCCTGGACATCGTGCCCATCAACGACTCCGCCAACAACAAC
TCCATCAACTCCGAGTACATGCTGATCAACTGCAACGCCTTCAACCATCAAGCAGGCCTGGCCTCCAAGGTGACCTTCGAGCCCATCCA
CTACTGCGCCCCCGCGGCTTCGCACCATCCTGAAGTGCAACGACACAAGAACTTCACCGGCCTGCCTGGGCCCTGGCCACCCGGCGTCCTCCGTGCAGT
GCACCCACGGCATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCGTGGCCAAGGCCGGCACCCGCCCCCCGAGGGCGTGGTGATCCGCTCCAAGAACTTC
ACCGACAACACCAAGAGAACATCGTGCAGCTGCTGCAGCCGAGATCCGGCGACATCGGCGACAATTTCCCCGGCGGCGGGCAAGTCCGTGCA
CATCGGCCCCGGCCCAGACCTGGTACGCGCACCGGGAGCTGCTGGTACGGGGAGCTGGGGGCCCACTGCGCCCCTCGGCGGCGGCGACCTGGAGATC
AGACCCTGCAGAAGATCGTGGAGGAGGCTGGGCGCGGCGAGTTCTTCTACTGCAACACCTTCCCCAACAAGAGACCATCATCTCCCCAACAAGAGACCAACTCCAC
ACCACCCACTCCTTCAACTGCGGCGGCGAGTTCTTCTACTGCAACACCTTCCCCAACAAGAGACCATCATCTCCGAGCTGTTCAACAACTCCAC
CACCATCAACAAGAGACCATCAACTGCTTCCTCCGGCATCAAGCAGCTGTGGGCCGTGCGCGAGGCGCAACAACAACAACCAGAGCCTTCCGC
CCCGGCGGCGGCGGGCCCCGCCGCCCGCCCTCCTCCGACAACTGGCGCTCCGAGCTGTACAAGTGGTGAAGATCGAGCCCGTGGGCGGTGGCGCCACCCG
CGCCCCGCCGCCCGCCCGCCCTCCTCCGACAACTGGCGCTCCGAGCTGTACAAGTGGTGAAGATCGAGCCCGTGGGCGGTGGCGCCACCATGG
GCGCCGGCCTCCATCACCCTGACCGTGCTGCCCCGCCGTGACCGTGACCGTGTGGGGCATCAAGGCGCCGGCATCAAGCAGCTGTGTCCGGCCGTGTCCGGCCGTGTCCGGC
CAGCAGCAGCACCTGCTGCTGCCCCTGACCGTGTGGGGCATCAAGGCGCCGGCATCAAGCAGCTGATCTGCACCACCAACGTGCCCACCAACGTCCTACAACGACAGCT
GCTGGGGCATCTGGGGCTGCTCCGGGCAAGCTGATCTGCACCACCAACGTGCCCACCAACGTCCTACAACGACATCT
GGGACAACATGACCTGGCTGCAGTGGGACAAGGAGATCAACAACTACACACCCCTGTGGAACTCATCTCCACCCAGAACCAGCAG
GAGAAGAACGAGAGCAGCAGGAGGATCAACGCCCCCGAGAGGAGGAGGGCGGCGAGCAGGAGGACCGCCTCCCGC
CTTCATCATGATCGTGGGGGCCCTGATCGGCGCCTGATCGGCATCATCTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCC
TGTCCCTGCAGACCCTGGTGAACGGCTTCCTGCCCCTGGACCGCCCACCACCGTGGACACCACCACCGTGGAACCTGGCCCTGGCCGC
TCCATCCGCCTGATCGGCCCCTGATCGGCATCGTGGGCAGCCTGGGAGGACACAGGAGCAACCTGGCCGCAGGCCCTGGGAGGAGTCCGTGTGGTACATCAAGAT
GCTGATCGTGGCCAACTGGTCCCGCGCCAACTGGGAGGACACAGGAGCAACCTGGCCGTGCTGCTGCGCAACCTGCT
AGCTGCGCAACTCCTGCTGGACCTGCTGTCCGCCTCCCGCGCAGGCCCATCCGCCATCCATCCGCCATCATCGAGGCCGTGCAGCGCGGCCAGG
TGCCGCCGCCCATCCGCCAACTCCCGCCATCCATCATCCGCCAACACATCCCCGCGATCCGCCATCATCGAGGCGCGCCAGCGGCGCGCC
```

Fig. 57A

2003 CON 06 CPX Env

MRVKGIQKNWQHLWKWGTLILGLVIICSASNNMWVTVYYGVPAWEDADTILFCASDAKAYSAEKHNVWATHACVPTDPNPQEIALENVTENF
NMWKNHMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTNVTKNNNTKIMGREEIKNCSFNVTTEIRDKKKKEYALFYRLDVVPIDDNNNSY
RLINCNASTIKQACPKVSFEPIPIHYCAPAGFAILKCRDKNFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEIIIKSENLTDNTKT
IIVQLNKSVEIRCTRPNNNTRKSISFGPGQAFYATGDIIGDIRQAHCNVSRTDWNNMLQNVTAKLKELFNKNITFNSSAGGDLEITTHSFNC
GGEFFYCNTSQLFNSTRPNETNTITLPCKIKQIVRMWQRVGQAMYAPPIAGNITCTSNITGLLLTRDGNNNDSETERPGGGDMRDNWRSELY
KYKVVKIPLGIAPTRARRRVVGREKRAVGLGAVFLGFLGTAGSTMGAASITLTVQVRQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQL
QARVLAVERYLKDQQLLGIWGCSGKLICPTNVPWNASWSNKTYNEIWDNMTWIEWDREINNYTQQIYSLIEESQNQQEKNEQDLLALDKWAS
LWSWFDISNLWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSLQTLIPNTGADRPGEIEEGGGEQGRTRSIRLVNGFLALAWDDL
RSLCLFSYHRLRDFVLIAARTVETLGHRGWEILKYLGNLVCYWGQELKNSAISLLDTTAIAVANWTDRVIEVVQRVFRAFLNIPRRIRQGFE
RALLS

Fig. 58A

2003 CON 08 BC Env

MRVRGTRRNYQQWIWGVLGFWMLMICNVEGNLWVTVYYGVPVWKEAKTTLFCASDAKAYETEVHNVWATHACVPTDPNPQEIVMENVTENF
NMWNNDMVNQMHEDVISLWDQSLKPCVKLTPLCVTLECTNVSSNGNGTYNETYNESVKEIKNCSFNATTLLRDRKKTVYALFYRLDIVPLND
ENSGKNSSEYYRLINCNTSAITQACPKVTFDPIPIHYCTPAGYAILKCNDKKFNGTGQCHNVSTVQCTHGIKPVVSTQLLLNGSLAEREIII
RSENLTNNVKTIIVHLNQSVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISKDKWYETLQRVSKKLAEHFPNKTIKFASSSG
GDLEITTHSFNCRGEFFYCNTSGLFNGTYMNGTNNNSSSIITIPCRIKQIINMWQEVGRAMYAPPIEGNITCKSNITGLLLVRDGGRTESNNT
EIFRPGGGDMRNNWRNELYKYKVVEIKPLGVAPTAAKRRVVEREKRAVGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLR
AIEAQQHMLQLTVWGIKQLQTRVLAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQQEIWDNMTWMQWDKEISNYTNTIYRLLEDS
QNQQERNEKDLLALDSWKNLWSWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQIILTPNPGGPGRLGRIEEGGEQD
KTRSIRLVNGFLALAWDDLRNLCLFSYHRLRDFLLLTARGVELLGRNSLRGLQRGWEALKYLGSLVQYWGLELKKSTISLVDTIAIAVAEGT
DRIINIVQGICRAIHNIPRRIRQGFEAALQS

Fig. 57B

2003 CON_06 CPX Env.seq.opt

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ATGCGCGTGAAGGGCATCCAGAAGAACTGGCAGCACCTGTGGAAGTGGGGCACCCTGCTGGGCCTGATCATCTGCTCCGCCTCCAA
CAACATGTGGGTGACCGTGTACTACGGCGTGCCCGGAGGACGCCGACACCATCCTGTTCTGCGCCTCCAAGGCCTACTCCG
CCGAGAAGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGCCCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACCACACATGGTGCACCAAGACACATCATCTCCCTGTGGGACGAGTCCGGCGAGATCATGGGCCGCCAAGGATCATGACGAGGAA...
```

Fig. 58B

2003 CON_08_BC Env seq.opt
ATGCGCGTGCGCGGCACCCGCCGCCAACTACCAGCAGTGGTGATCTGGGCGGCTGCTGGGCTTCTGGATGCTGATGATCTGCAACGTGGGAGGG
CAACCTGTGGGTGACCGTGACTACGGCGTGCCCGTGTGGAAGGAGGCCAAGACCACCCCCAGGAGGCCAAGGCCTACGAGA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCTGAACCCCCAGGAGATCGTGGAGAACGTGACCGAGAACTTC
AACATGTGGAACAACGACACATGGTGAACCAGATGCACGAGGACGTGATCTCCCTGTGGGACCAGTCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAGCTGTGAGTGCACACCCTGTCCTCAACGGCACCTGTCCCCAACAACGTGTCCGTGAAGGAGATCAAGA
ACTGCTCCTTCAACGCCACCACCCTGCTGCGCGACCAGAGAACCGTGACGCCCGTTCTACCGCGCCTGGACATCGTGCCCCTGAACGAC
GAGAACTCCGGCAAGAACTCCTCCGAGTACTACCGCCTGATCAACTGCAACACCTCCGTGATCACGCAGGCCTGGCCCAAGGTGACCTTCGA
CCCCATCCCCATCCCACTACTGCACCCCGGCTACGCCCGGCTACGCCCGTGGTGTCCACCCAGTCGCCGAGATCATCATC
TGTCCACCGTGCAGTGCACCCCCACGCGCATCAAGCCGTGGTGTCCAACCAGTCCGTGGAGATCGTGCACCCCCAACAACAC
CGCTCCGAGAACCTGACCAACAAGTGAAGACCATCATCGGCGACCTTCTACGCCCGGCGACATCGGCGACATCGGCGACATCTCCA
CCGCAAGTCCATCCGGCCATCGACCTTCCAAGAACGCTGGCCGGAGTTCTTCTACTGCCGCCGAGTTCGCCTCCTCCGGC
AGGACAAGTGGTACGAGACCCTGCAGCCGTGTCCAAGAAGCTGGCCGGAGTTCTTCTACTGCGCCGAGAAGACCATCAAGTTCGCCTCCTCCGGC
GGCGACCTGGAGATCACCACCCACTCCTTCAACTGCCGCGGAGTTCTTCTACTGCCCATCAGGAGGTGGCCGCATGTACG
CGGCACCAACAACTCCTCCTCCATCACCTGCAAGATCATCAAGCAGATCATCAACATGTGGCAGGAGGTGGGCCGCCATGTACG
CCCCCCCCATCGAGAGGCAACAACATCCTGCAAGTCCAACTACCTGCAAGGTGGCGACGGCCGCGAGTCCAACAACACC
GAGATCTTCCGCCCCGGCGCGCGCCAGCGCCGCCGCCGCAACATGGCGACATGGCCAACTGGCCGAGATCAAGGTGGTGTTCCTGGGCGT
GGCCCCCGCCGGCGCCAAGCGCCGCCGCCAGCGCCGCGAGGCGTGGGCCTGGGCGCCGTGTTCCTGCAGCAGTCCAACCTGCTGCGC
GCTCCACCATGGGCGCCCCAGCAGCACATGCCCGCCTCCATCGCCGGCCATCAAGCGCGTGTCCGGCCATGACCCGCCGTCTGCTGAAC
GGACCAGCAGCTGCTGGGCGTGCTCCGGCCAAGCTGATCTGCACGCGCCCGTGTTCGCCAAGCTCCTCCTGGTCCAACAAGTCCC
AGCAGGAGAGATCTGGGACAACATGACCTGGATGCAGTGGGACAACGCCCAGCAGCAGGAGATCTCCAAGCTGGAAGAACTGGCTGTG
CAGAACCAGCAGGAGAAGAACGAGAAGGACCTGCTCGGCCCTGATCGGTGGCCCTGATCGTGTCCAAGAACCTGTGGTCCTGGTTCGACATCTTCGCCTCCTTGTG
GTACATCAAGATCTTCATCATGATCGTGGGCGGCCTCTGCTGGGCGTCCTGGCCCTGCCGACTCATCTTCGCCGTGCTCGTGCTCTCTCCACCATCCCGCGCGG
GCTACTCCCGTGTCCTTCCAGATCCTGACCCCCACCCCCCGCGGGCCTGGCGTGGCCATCTGCGCCCGGCCTGCGCTGGCTGCGCTGGCTGCGCG
AAGACCCGCTCCATCCGTGGTGAACGGCTTCCTGGCCCTGGCCGCTGGAGCTGGCGCCGCGCTGCTCCGGCCGCCATCGCCACCGGCCACC
CGACTTCATCCTGCTGGTACTGCAGTACTGGGCGTACTGGGCCTGCTGGAGCTGGAAGAGTCCACCATCTCCCTGTGTGATGACACCATCTCCCTGAAGTACC
TGGGCTCCCTGGTCCAGTACTGGGGCCTGGAGCTGGAGGGCCGTCCTCCCTGGGAGGCGTGGGGGCCTGGAGGGCACC
GACCGGCCATCATCAACATCGTGCCAGGGCATCGGCGCTGCCGCCCAGGGCTTCGAGGCGCTTCGAGGGCTTCGAGGCCTGCAGTA
A

Fig. 59A

2003 CON_10_CD Env

MRVMGIQRNCQQWWIWGILGEWMLMICNATGNLWVTVYYGVPVWKETTTLFCASDAKAYKAEAHNIWATHACVPTDPNPQEIVLENVTENF
NMWKNGMVDQMHEDIISLWDQGLKPCVKLTPLCVTLNCSDVNATNSATNTVAGMKNCSFNITTEIRDKKKQEYALFYKLDVVQIDGSNTSY
RLINCNTSAITQACPKVTEEPIPIHYCAPAGFAILKCNDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIIRSENLTDNAKT
IIVQLNESVTINCTRPNNNTRKSIRIGPGQTFYATGDIIGNIRQAYCNISGTEWNKTLQQVAKKLGDLLNKTTIIFKPSSGGDPEITTHTFN
CGGEFFYCNTSKLFNSSWTSNNTGNTSTITLPCRIKQIINMWQGVGKAIYAPPIAGLINCSSNITGLLLTRDGGANNSETFRPGGGDMRDNW
RSELYKYKVVKIEPLGLAPTKAKRRVVEREKRAIGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQNLLRAIEAQQHLLQLTVW
GIKQLQARVLAVESYLKDQQLLGIWGCSGKHICTTNVPWNSSWSNKSLEEIWDNMTWMEWEREIDNYTGLIYSLIEESQNQQEKNEQELLQL
DKWASLWNWFSITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLLPAPRGPDRPEGIEEEGGEQGRGRSIRLVNGFSAL
IWDDLRNLCLFSYHRLRDLILIATRIVELLGRRGWEAIKYLWNLLQYWIQELKNSAISLLDTAIAVAEGTDRAIEIVQRAVRAVLNIPTRI
RQGLERALL$

Fig. 60A

2003 CON_11_CPX Env

MRVKETQRNWHNLWRWGLMIFGMLMICNATENLWVTVYYGVPVWKDADTTLFCASDAKAYSTEKHNVWATHACVPTDPNPQEIPLENVTENF
NMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVKNATNTTVEAAEIKNCSFNITTEIKDKKKEYALFYKLDVVPINDNNNSIY
RLINCNVSTVKQACPKVTEEPIPIHYCAPAGFAILKCNDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEGEVRIRSENFTNNAKT
IIVQLNSSVRINCTRPNNNTRKSIHIGPGQAFYATGDIIGDIRQAHCNISRAEWNNTLQQVAKQLRENFNKTIIFNNPSGGDLEITTHSFNC
GGEFFYCNTSRLFNSTWNNDTRNDTKQMHITLPCRIKQIVNMWQRVGQAMYAPPIQGKIRCNSNITGLLLTRDGGNNNTNETFRPTGGDMRD
NWRSELYKYKVVEIKPLGVAPTRAKRRVVEREKRAVGIGAVLLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLKAIEAQQHLLKLT
VWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNFSWSNKSYDEIWDNMTWIEWEREINNYTQTIYTLLEESQNQQEKNEQDLL
ALDKWASLWNWFDISNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRCRQGYSPLSFQTLTPNHKEADRPGGIEEGGGEQDRTRSIRLVSGFL
ALAWDDLRNLCLFSYHRLRDFLIAARIVETLGRRGWEILKYLGNLAQYWGQELKNSAISLLNATAIAVAEGTDRIIEVVHRVLRAILHIPR
RIRQGFERALL$

Fig. 59B

2003 CON 10 CD Env.seq.opt

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ATGCGCGCCGTGATGGGCATCCAGCCAGCAGTGGTGGATCTGGGCATCCTGGGCTTCTGGATGCTGATGATCTGCAACGCCACCGG
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGACCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACAAGG
CCGAGGCCCACAACATCTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACGGCATGGTGGACCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCTCCGACGTGGAACTCCGCCACCAACTCCGCGGCCTGTTCTACAAGGCTGGAAGAACTGCTCCTTCAACA
TCACCACCGAGATCCGCGACAAGAAGCAGAAGGTACGCCCTCTGCCCCAAGAGCTGGTGGTGTCCAAGCACACTTCCTAC
CGCCTGATCAACTGCAACACCTCCGTGATCACCCAGGCCTGCCCCAAAGTTCAACGACACAAGAAGTTCAACGGCCTCCCTGGCCTGAACGGCATCAAGC
CTTCGTGGTGTCCAGCTGCTGAAAGAATCGTCCGTGACCGCTCTGCCGAGGAGGAGATCATCAACAACACACCCGGCACCCTGACCACCGAGAACCTGACCGACACAACCGCCAGGACC
ATCATCGTGCAGCTGAAGGAGTCCGTGACCATCAACTGCACCCGGCCCAACAACAACACCCGCAAGAGTATCCGCATCGGCCCCGGCCAGGTGG
CTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCTACTGCAACATCTCCGAGTGGAACAAGACCCTGCAGCAGGTGG
CCAAGAAGCTGGGCGAGCTGTTCAACCACACCCTGTTCAAGCAGCCCTCCGGCGGCGACCCTGAGATCACCACCACCTTCAAC
TGCGGCGGCGAGTTCTTCTACTGCAACACCAGCAACCTGTTCAACGCCCCATCAACTGGAACGTGGGCAAGGCCGTGGGCAACATGACCCCCCGCCCCATCCCCCGCGGC
GCCCTGCCCGCCATCAAGCAGATCATCAACAAGTGGCAGGCCGTGGGCAAGGCCATGTACGCCCCATCCGCGGCCAACAACTCCGAGACCCTTCCGCGCCGCGGCGGCGAGGCCCTGG
CCAACATCACCGGCCTGCTGCTGACCCGGGCCCAACAACTCCGAGACCTTCCGCCCCGGCGGCGGCGACATGCGCGACAACTGG
CGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCGCCCTGGGAGGCGGAGAA
GCGCGCCGTGGCCTGCGTGTTCCTGGGCTTCCTGGGCGCAGCAGAACAACCTGCTGCGGGCCATCGAGGCCCAGCAGCACCTGCTGCAGCTGACCGTGTGG
CCCGCCGCTGCTGCTGGCCGCCATCGGCCGGGCTGGCCGGGCTGCTGGGGCGTGCTGCTGACCGTGTGG
GGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGGTACCTGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCA
CATCTGCACCACCACCGTGCCCTGGAACGCCTCCTGGTCCAACAAGTCCCTGGAGGAGATCTGGGACAACATGACCTGGATGGAGTGGGAGC
GCGAGATCGACAACTACACCGGCCTGATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGAACGAGCAGGAGCTGCTGAGCTG
GACAAGTGGGCCTCCCTGTGGAACTGGTTCTCCATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGG
CCTGCGCATCGTGTTCGCCGTGCTGTCCCTGGTGAACCGCGTGCGGCAGGGCTACTCCCCGGTTCTCCCGCCCTG
GCGCCCCGACCGCCCCGAGGGGCATCGAGGAGGAGGGCGGCGAGCAGGCCGGCGGCGACCGGGCCTTCCGCCCCTG
ATCTGGGACGACCTGCGCAACCTGTGCCTGTTCTCCTACCACCGGCTGCGCGACCTGCTGCTGATCCGCGCCGCGCCCTGGGAGCTGCTGGGG
CCACCGCCGCTGGCCGCCGTGGCCGGAGGCCACCGGCGCCATCGCCGTGGGAGGAGCTGCTGCTGGGGCCGTGCTGGACA
CGCCAGGCCTGGGAGGCCCTGGGAGCGGCCGTGCTGCGCCATCGAGAGATCGTGCTGCGCGCCGTGCTGAACATCCCCACCCGCATC
CGCCAGCAGGGCCTGGGAGCGCCCTGCTGTAA
```

Fig. 60B

2003 CON 11 CPX Env.seq.opt

ATGCGCGGTGAAGGAGAGACCCAGCGCAACCTGTGGCGCTGGGGCCTGATGATCTTCGGCATGCTGATGATCTGCAACGCCACCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGACGCCGACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACTCCA
CCGAGAAGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCCACCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCGACGTGAACTGCGAGGCCGCCACCACCACCCTGAAGAACGACACCAGCTGCTCCTTCAACATCA
CGCCTGATCAACTGCACGTGTCCACGGTGCCACCGGCCTGCCCATCCCATCCCGTGCAGTGCACCAACAACGCCAAGACC
CTTCGCCATCCTGAAGTGCAACGACAAGGAGTTCAACGGCACCGGCTCCTGGCCGAGGCGAGGTGCGCATCATCCACCCAACAACGCCCAGGCCAGGC
CCGTGGTGTCCAGCTGCTGAACTGCTCCGTGCGATCATCGGCGACATCATCGGCGACATCATCTTCAACAACCTCCCGGCGGCGACCTGGAACTGC
CCAAGCAGCTGCGCGAGAACTTCAACAAGAGATGTCAACAACACCTCCCGCGGCGACCTGGAGATCCAACGACACCCGCAACCAGCCCATGTGGAGATGCACCAC
GGCGGCGAGTTCTTCTACTGCAACAACCTCCCGTTCAACTCAACTTCAACTGC
CCTGCCCGCCATCAAGCAGATCGTGAACATGTGGCAGCGCGTGGGCCAGCCCGATCATCCGCTGCA
ACTCCAACATCACCGGCCTGCTGCTGACCCGCGATGTGGGCGGCAACACAACCAACACCGAGAACATCCGCTGCTGCTGCTGGAGCG
AACTGGGCGCTCCGAGCTGTACAAGTGGTGGAGATACAAGGGCGCCGCCATGCGCGGTGGTGAGCCG
CGAGAAGCGCGCCGCCGGCATCAAGCGCCTGCTGGGCGGTGCGCGCTCCATCACCCTGACCG
TGCAGGCCCGCCAGCTGCTCAAGGCCCAGCAGCAGCGCGCGCCGCCCAGCAGCACTGCTGGGCGCTGCTCCGG
GTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTTACCTGGAGGGCTGGAAGCTGACC
CAAGCGGCCTGATCTGCACCACCAACGTGCCCTGGAACTGCCTCTCCGGTCAACAAGTCCTACGACGAGGAGTCCCAGAACCAGATCTTCATCGAGT
GGGAGCGCGAGATCAACAACTACACCAACCTGATCTACGCCCTGCTCGAGGAGTCCCAGAACCAGATCTTCATCGAGT
GCCCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCTCCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCT
GATCGGCCTGCGCATCGTCTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCGCTGTCCTTCCAGACCCTGCTCCCCA
GCCCTGCCGCCTGGACGAGCTGGGCCGCCGCCCGTTCTCCTACCTGCTGCTCCAGAACCTGGCCATCCCGCGGCGTTCATCCTGATCGTGGAGAC
CCTGGGGACGCCTGGCGCGCGGCGCCCATCGCCTGGGACGCGTGGGCAACCTGGCAACGCCCAGTACTGGGGCAACCTGGGCAACCTGGGGCCAGGAGAACTCCCTGC
TGAACGGCCACCGCCATCCGCTGGGCCGAGGCCCGGCCAGCGGCCAGTACTGGTGGTGCGCGACCATCATCGAGGTGGTGCGCGGCCATCCTGCACATCCCCCGC
CGCATCCGCCAGGGCTTCGAGCGCGCCCTGCTGTAA

Fig. 61A

2003 CON_12 BF Env

MRVRGMQRNWQHLGKWGLLFLGLILICNATENLWVTVYYGVPVWKEATTLFCASDAKSYEREVHNVWATHACVPTDPNPQEVDLENVTENF
DMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCTDANATANATKEHPEGRAGAIQNCSFNMTEVRDKQMKVQALFYRLDIVPISDN
NSNEYRLINCNTSITQACPKVSWDPIPIHYCAPAGYAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEIIRSQNIS
DNAKTIIVHLNESVQINCTRPNNNTRKSIHIGPGRAFYATGDIIGDIRKAHCNVSGTQWNKTLEQVKKKLRSYFNTTIKENSSSGGDPEITM
HSFNCRGEFFYCNTSKLFNDTVSNDTIILPCRIKQIVNMWQEVGRAMYAAPIAGNITCTSNITGLLLTRDGGHNETNKTETFRPGGGNMKDN
WRSELYKYKVVEIEPLGVAPTRAKRQVVKREKRAVGIGALFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQSNLLRAIEAQQHLLQLTV
WGIKQLQARVLAVERYLKDQQLLGLWGCSGKLICTTNVPWNSSWSNKSQEEIWENMTWMEWEKEINNYSNEIYRLIEESQNQQEKNEQELLA
LDKWASLWNWFDISNWLWYIRIFIMIVGGLIGLRIVFAVLSIVNRVRKGYSPLSLQTHIPSPREPDRPEGIEEGGGEQGKDRSVRLVNGFLA
LIWDDLRSLCLFSYHRLRDLLLIVTRIVELLGRRGWEVLKYWWNLLQYWSQELKNSAISLLNTTAIVAEGTDRVIEALQRVGRAILNIPRR
IRQGLERALL$

Fig. 62A

2003 CON_14 BG Env

MKAKGTQRNWQSLWKWGTLILGLVIICSASNDLWVTVYYGVPVWKEATTLFCASDAKAYDAEVHNVWATHACVPTDPNPQEVALENVTENF
NMWENNMVDQMQEDIISIWDQSLKPCVELTPLCVTLNCTDFNNTTNNTTNTRNDGEGEIKNCSFNITTSLRDKIKKEYALFYNLDVVQMDND
NSSYRLTSCNTSIITQACPKVSFTPIPIHYCAPAGFVILKCNNKTFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAEEIVIRSKNFTD
NAKTIIVQLKDPIEINCTRPNNNTRKRITMGPGRVLYTTGQIIGDIRKAHCNISKTKWNNTLGQIVKKLREQFMNKTIVFQRSSGGDPEIVM
HSFNCGGEFFYCNTTQLFNSTWRSNSTWNDTTETNNTDLITLPCRIKQIVNMWQKVGKAMYAPPISGQIRCSSNITGLLLIRDGGSNNTETF
RPGGGNMKDNWRSELYKYKVVKIEPLGVAPTRAKRRVQREKRAVGIGALLFGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIE
AQQHMLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTVPWNASWSNKSLDDIWNNMTWMEWEREIDNYTGLIYTLIEQSQNQ
QERNEQELLELDKWASLWNWFNITNWLWYIKIFIMIIGGLIGLRIVFAVLSIINRVRKGYSPLSFQTLTHHQREPDRPGRIEEGGEQDKDR
SIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVELLGRSSLKGLRLGWEGLKYLWNLLLYWGRELKNSAINLLDTVAIAVANWTDRA
IEVVQRVGRAVLNIPVRIRQGLERALL$

Fig. 61B

2003 CON_12_BF_Env.seq.opt

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ATGCGCGGTGCGCGGCCATGCGAGCGCAACTGGCAGCACCTGGGCAAGTGGGGCCTGGGCCAGCACACCTGGGCAAGTGGGGCCTGGGCCAGCACACCTGGGCATCATCCTGATCATCTGCAACGCCACCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGTCCTACGAGC
GCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGGTGGACCTGGAGAACGTGACCGAGAACTTC
GACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTCCCTGCAGCCCTGCGTGAAGCTGACCCCC
CCTGTGTCCGTGACCCTGAACTGCACCGACCTGGGCAACGCCACCAACACCACCAACAGCAGCGTGCCCGAGGGCGGCATCCAGAACT
GCTCCTTCAACATGACCACCGAGGTGCGCGACAAGCAGCAGAAGGTGCACGCCCTGTTCTACCGCCTGGACATCGTGCCCATCTCCGACAAC
AACTCCAACGAGTACCGCCTGATCAACTGCAACACCTCCACCATCACCCAGGCCTGCCCCAAGGTGTCCTGGGACCCCATCCCCATCCACTA
CTGCGCCCCCGCCGGCTACGCCATCCTGAAGTGCAACGACAAGAAGTTCAACGGCTCCCTGGCCGAGGAGGAGATCATCATCCGCTCCCAGAACATCTCC
CCCACGGCATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGAGGAGGAGATCATCATCCGCTCCCAGAACATCTCC
GACAACCGCCAAGACCATCATCGTCACGGCAGTCCGTGCAGATCAACGAGTCCGTGCAGATCAACCACCACCCGCAAGTCCATCCACAT
CGGCCCCGGCCGGCCTTCTACGCCACGGCGCCATCATCGGCGCACACCATCAAGTTCAACACCACCATCAAGTTCAACAACGACACCTCCAAGCTGTCCAACGACACCGTGCCCGGCGACATCATCCTGCCCCTG
CCCTGGAGCAGGTGAAGAAGAAGAGCTGCGCCGCGGGCGAGTTCTTCTACTGCAACACCACCTCCAAGCTGTCCAACGACACCGTGCCCGGCGACATCATCCTGCCCCTG
CCGCATCAAGCAGATCGTGCTGACCCCGCGACGCGGCCAACGAGACCCGCGCCCGGCCCGGCGCAACATGAAGGACAAC
TCACCGGCCTGCTGCCGAGCGTGACAAGTACAAGGTGCCGCCAGAGCTGGTGAAGCGGGCCAGGTGGTGAAGCGGCGGA
TGGCGGCTCCGAGCGTGGTGACAAGTACAAGGTGCTCGGGCGCCTTCCTGGGCGCCAGCAGCACCCTGCCTCCATCACCCTGCCTCCAGCTGCACCGTGC
GAAGGCCCCGGCCAGCTGCTGTCCGGCATCGTGCGCCGCCGCATCGTGGGGGCCTTCCTGGGCGCCAGCAGCACCCTGCCTCCAGCTGCACCGTGC
AGGGGCATCAAGCAGCTGCAGGCCGTGGAGCGCTACCTGGGCGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAA
TGGGGCATCAAGCAGCTGCAGGCCGTGGAGCGCTACCTGGGCGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAA
GCTGATCTGCACCACCGCCGTGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCTGGATGGAGTGGGG
AGAAGGAGATCAACAACTACTCCAACGAGATCTACCGCCTGCTGGAGGAGAGCCAGAACCAGCAGGAGCAGGAGCTGCTGGCC
CTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCTCCAACTGGCTGTGGTACATCCGCATCTTCATCATGATCGTGGGCGGCCTGAT
CGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTCAACCGCGTGCGCAAGGGCTACTCCCCCCTCCCCGAGACCCTCCTGGCC
CCCCGCGAGCCCGACCGCCCCGAGGGCATCGAGGAGGGCGGCGAGCGCGACCGCGACCGCTCCGGCCGCCTTCCTGGCC
CTGATCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCGCCTGCGCGACCTGCTGGAGCCTGCTGGGGGGGG
GGGCCGCCGCGGCTGGGAGGTGCTGAAGTACTGGTGGAACCTGCTGCAGTACTGGGGCCAGGAGGCTGAAGAAGAACTCCCGCCCATCCTGCTGA
ACACCACCGCCATCGCCGTGGCCGAGGGCACCGACCGCGTGATCGAGGCGGCGTGATCCTGAACATCCCCGGCGC
ATCCGGCCAGGGCCTGGAGGCCGGCCGGCGCCCTGCTGTAA
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Fig. 62B

2003 CON 14 BG Env.seq.opt

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ATGAAGGCCAAGGGCACCCAGCGCAACTGGCAGTCCCTGTGGAAGTGGGGCACCCTGCTGATCATCCTGCTCCGCCTCCAA
CGACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCTACGACG
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGTGCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGGAGCTGACCCC
AACATGTGGCGTGAACAACATGGTGGAACAGATGCAGGAGGACATCATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGGAGCTGACCCC
CCTGTGTCGTGCCTGACCCTGAACTGCACCGACTTCAACAACAACACCACCACCAACAACAGGAGTACGCCCGTGTTCTACAACCTGGACCTGGTGCAGATGGACAACGAC
GCTCCTTCAACATCACCACCTCCGCCAGACCTCCTGCAACAACCTCCATCATCAACAAGACCTTCAACGGCACCGGCCTGCCCCAGGCCTGCCCCAGGTGTCCTTCACCAACAGTGTCCACCCG
AACTCCTCCTACCGCCCTGACCTCCTGCAACAACCTCCATCATCAACAAGACCTTCAACGGCACCGGCCTGCCCCAGGCCTGCCCCAGGTGTCCTTCACCAACAGTGTCCACCCG
CGCCCCCCGCCGGCTTCGTGACTGTGTCCGTGTGTGTCCCAGCTGCTGTGATCCTGAACGGCTGCTCCCTGGCCGCGAGGAGAGATCCCGCCCAGGTGTCCTTCACCAACAGTGTCCACCCG
ACGGCATCCGCCCCGTGTGGTCCCGTGTGTTCCATCGAACTGCACCGGGAGATCAACTGCACCGACCCCATCAACCAACACCGGGGAGATCAACTGCACCGACCCCATCAACCAACACCG
AACGCCAAGACCATCATCGTGCTGTACACACCGGCCCCATCAACCAACACCGGGGAGATCAACTGCACCGACCCCATCAACCAACACCGGGGAGATCAACTGCACCGACCCCATCAACCAACACCG
CCCCGGGCCCGTGCTGTATACACCGGCCCCATCAACCAACACCGGGGAGATCAACTGCACCGACCCCATCAACCAACACCGGGGAGATCAACTGCACCGACCCCATCAACCAACACCG
TGGGCCCAGATCGTGAAGAAGAGCTGCGGCGGCGAGTTCTTCTACTGCAACAACAGACCATCGTGTTCAACTGCGTGTTCAACTGCGGCCTCCAACTCCTGGAAGCGACACAC
CACTCCTTCAACTGCGGCGGCGGCCGAGTTCTTCTACTGCAACAACAGACCATCGTGTTCAACTGCGTGTTCAACTGCGGCCTCCAACTCCTGGAAGCGACACAC
CACCGAGACCAACACCGACCTGATCAACCCTGCCCCATCAACCAACACCGGGGAGATCAACTGCAACATGTGGCAGAAGCCCATGTACG
CCCCCCCATCCGCCAGATCCGCTGCTGCTGCTCCAACATCACCGGCCTCCGAGCTGTACAAGGTGGTACAAGTACCAACCGACACCTTC
CGCGCCCGCGGCCAACAATGAAGAGACAACTGGCGCCAACAATGAAGAGACAACTGGCGCCAACAATCGGCCCGTGGGCCCCGCTGGCCCCCAC
CCGCGCCAAGCCGCCGTGCAGCGCGCCAGCGAGAGCGCCCGTGGGCGCCCGCCGGCTCCACCA
TGGGCGGCCGCCCTCCATGACCCTGCAGCTGCACCGTGTGGGGGCATCAAGAGCAGCTGCCCCGTGCTCGTGCGCCGCCATCGAG
GCCCAGCAGCACCATGCTGCAGCTGACCGTGTGGGGGCATCAAGAGCAGCTGCCCCGTGCTCGTGCGCCGCCATCGAG
GCTGCTGGGCATCTGGGGCGTGCTGCTCCGCGCAAGCTGATCTGCACCACCGCCGAGATCGCCGAGATGAACGCCCTCCTGGTCGTGGAACCAGGACCAGCA
TCTGGAACAACATGACCTGGATGGAGTGGGAGCGCGAGATCGACAACTACACCGGCCTCATCGAGCAGTCCCAGAACCAG
CAGGAGGCGCAACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCAACATCACCAACTGGCTGTGGTACATCAA
GATCTTCATCATGATCGTCGGCGCTGATCGGCCTGAGGTCCTCGTTTCGCGCCCGACCTGCGTGTTCCATCATCAACCGCGTGCGCCAAGGGCTACTCCCC
CCCTGTCCTTCCAGACCCCTGGTTCTTCCGGCTTCCTGGGCACCGTGCTGGGCCTCCCTGGGACGACCTGCGTGTTCCTCCTCCCGCAAGAGGGCCGACTTCAT
TCCATCCGCCTGGTGTTCCCGGCCACCGTGGCCCCGAGCTGCTGGAACTCCGGCCATCCGCCTGCCTGGAGGGCCTGCGGAGGGCCTGAAGTAGTACCTGTGGAACC
CCTGATCGGCCCGTGCAGCTGGCCCCGAGCTGAAGAACTCCGGCCATCCGCCTGCCTGGAGGGCCTGCGGAGGGCCTGCAACTGGACCGACCGCGCC
TGCTGCTGTACTGGGGCGTGCAGCGTGCAGCCCGAGCGCCATCGAGCCCAGGGCCTGGAGCGCGTGGAGCGCCTGGAGCGCCTGGAGCGCGACCGCGCC
ATCGAGGTGGTGCAACGCCGTGGGCGCCGTGCTGCTGAACATCCCGTGCTGAACATCCCCGTGCTGGGGCCTGGAGCGCGTGGAGCGCCTGGAGCGCCCTGCTGTAA
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Centralized HIV-1 gag/nef/pol Protein and the Codon-optimized Gene Sequences

Fig. 63A

1. 2003_CON_S gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEGCQQIIEQLQPALQTGSEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEEQNKSKQKTQQAAADTGNSSKVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMS
QVTNTTIMMQRGNFKGQKRIIKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAE
SFGFGEEITPSPKQEPKDKELYPLASLKSLFGNDPLSQ$

Fig. 63B

2003_CON_S gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCAGCAGATCATCG
AGCAGCTGCAGCCCGCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCTCGCGGCTCCGACATCGCTGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGACCAACACCACCATCATGATGCAGCGCGGCAACTTCAAGGGCCAGAAGCGCATCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCA
CATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCGCCGAG
TCCTTCGGCTTCGGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCCCAAGGACAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

Fig. 64A

2. 2003 M.GROUP.anc gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIMGQLQPALQTGTEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEEQNKSQQKTQQAAADKGDSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QVTNANIMMQRGNFKGPRRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAE
SFGFGEEITPSPKQEPKDKELYPLASLKSLFGSDPLSQ$

Fig. 64B

2003 M.GROUP.anc gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCGCCGCCGACAAGGG
CGACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCGGCCAGATCCCCGTGGGCGCCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGACCAACGCCAACATCATGATGCAGCGCGGCAACTTCAAGGGCCCCCGCCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCA
CATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCGCCGAG
TCCTTCGGCTTCGGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCCCAAGGACAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTCCCTGTT
CGGCTCCGACCCCCTGTCCCAGTAA

Fig. 65A

3. 2003_CON_A1 gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPSLLETTEGCQQIMEQLQPALKTGTEELRSLYNTVATLYCVHQRI
DVKDTKEALDKIEEIQNKSKQKTQQAAADTGNSSKVSQNYPIVQNAGQMVHQSLSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTPQEQIGWMTGNPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTETLLVQNANPDCKSILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QVQHTNIMMQRGNFRGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAEI
FGMGEEITSPPKQEQKDREQDPPLVSLKSLFGNDPLSQS

Fig. 65B

3. 2003_CON_A1 gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCACCGAGGGCTGCCAGCAGATCATGG
AGCAGCTGCAGCCCGCCCTGAAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGAGCAAGCAGAAGACCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCGGCCAGATGGTGCACCAGTCCCTGTCCCCGAGGGCCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCATCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGTGGGCAGCGACATCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCGCCA
TACTCCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACGCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGAGCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCAGGCCATGTCC
CAGGTGCAGCACCAACATCATGATGCAGCGCGGCAACTTCCGCGGCCAGAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGCCCCGAGCCCACCGCCCCCCGAGATC
TTCGGCATGGGCGAGGAGATCACCTCCCCCCCCAAGCAGGAGCAGAAGGACCGCGAGCAGGACCCCCCCCTGGTGTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

Fig. 65C

4. 2003_A1.anc gag.PEP
MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIMGQLQPALKTGTEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEIQNKSKQKTQQAAADTGNSSKVSQNYPIVQNAQGQMVHQSLSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTGNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTETLLVQNANPDCKSILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QVQNTDIMMQRGNFRGPKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAEN
FGMGEEMISSPKQEQKDREQYPPLVSLKSLFGNDPLSQ$

Fig. 65D

2003_A1.anc gag.OPT
ATGGGCGCCCGCGCCCTCCGTCCGCTGCTGTCCGGCGGCGGCAAGCTGGACGCGCCTGGGAGAAGATCCGCCTGCGCCCTGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCCCTGAAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGAGCAAGCAGAAGACCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGTCCCTGTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCTGGCACCACTAGCACCCTGCAGGAGC
AGATCGGCTGGATGACCGGCAACCCGCCCATCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACGCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCGCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGCAGAACACCGACATCATGATGCAGCGCGGCAACTTCCGCGGCCCCAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGCCCCGAGCCCACCGCCCCCCCTGCAGAGAAC
TTCGGCATGGGCGAGGAGATGATCTCCTCCCCCAAGCAGGAGCAGAAGGACCGCGAGCAGTACCCCCCCCTGGTGTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

Fig. 66A

5. 2003_CON_A2 gag.PEP

MGARASILSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELEKFSINPSLLETSEGCRQIIRQLQPALQTGTEELKSLYNTVAVLYCVHQRI
DVKDTKEALDKIEEEQNKCKQKTQHAAADTGNSSSSSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFTALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTDTLLVQNANPDCKSILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMS
QVQNTNIMMQRGNFRGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFPQSRTEPTAPPA
ENLRMGEEITSSLKQELKTREPYNPAISLKSLFGNDPLSQ$

Fig. 66B

2003_CON_A2 gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGAAGTTCTCCATCAACCCCTCCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCATCC
GCCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCGTGCTGTACTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTGCAAGCAGAAGACCCAGCACGCCGCCGCCGACACCGG
CAACTCCTCCTCCTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCACCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCGGCCAGATGCGCGAGCCCCGTGGGCGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGA
AGATCGGCTGGTGATGACCTCCAACCCCCCCATCCCGGCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTAC
TACTCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGACCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCAACTTCCGCGGCCAACTTCCGCGGCCAACTTCCGCGGCCATGTCC
CAGGTGCAGAACACCAACATCATGATGCAGCGCGGCAACTTCCGCGGCCAGAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGG
CCACCTGGCCCGCAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCC
AGGCCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACCCGCCCAGTCCCGCACCGAGCCCACCGCCCCCCCGCC
GAGAACCTGCGCATGGGCGAGGAGATCACCTCCTCCCTGAAGCAGGAGCTGAAGACCCGCGAGCCCTACAACCCCGCCATCTCCCTGAAGTC
CCTGTTCGGCAACGACCCCCTGTCCCAGTAA

SUBSTITUTE SHEET (RULE 26)

Fig. 67A

6. 2003_CON_B_gag.PEP

MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGSEELRSLYNTVATLYCVHQRI
EVKDTKEALEKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRM
YSPTSILDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMS
QVTNSATIMMQRGNFRNQRKTVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPE
ESFRFGEETTTPSQKQEPIDKELYPLAS$

Fig. 67B

2003_CON_B_gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCGAGCTGGACCGCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACAAGCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGG
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGGAGCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAAGGCCCAGCAGGCCGCCGACACCGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCGCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCAACAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCACCTCCATCCTGGACATCCGACAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCTCCCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGCCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCAGGACACCGTGAAGGCCATGTCC
CAGGTGACCAACTCCGCCACCATCATGATGCAGCGCGGCAACTTCCGCAACCAGCGCAAGACCGTGAAGTGCTTCAACTGCGGCAAGGAGGG
CCACATCGCCAAGAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAG
AGGCCAACTTCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCAGGCAACTTCCTGCAGTCCCGGCCCGAGCCCACCGCCCCCCCGAG
GAGTCCTTCCGCTTCGGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACAAGGAGCTGTACCCCCTGGCCTCCTAA

Fig. 67C

7. 2003_B.anc gag.PEP

MGARASVLSGGKLDKWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPALQTGSEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRM
YSPISILDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMS
QVTNSTTIMMQRGNFRDQRKIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPE
ESFRFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPSSQ$

Fig. 67D

2003_B.anc gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACAAGCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGG
GCCAGCTGCAGCCCGCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAAGGCCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGTGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCAACAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCATCTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCTCCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGCCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGACCAACTCCACCACCATCATGATGCAGCGCGGCAACTTCCGCGACCAGCGCAAGATCGTGAAGTGCTTCAACTGCGGCAAGGAGGG
CCACATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCC
AGGCCAACTTCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGAG
GAGTCCTTCCGCTTCGGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTC
CCTGTTCGGCAACGACCCCTCCTCCCAGTAA

Fig. 68A

8. 2003_CON_C_gag.PEP

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MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLQPALQTGTEELRSLYNTVATLYCVHEKI
EVRDTKEALDKIEEEQNKSQQKTQQAKAADGKVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTM
LNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRMYSP
VSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQAN
NTNIMMQRSNFKGPKRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNELQNRPEPTAPPAESFR
FEETTPAPKQEPKDREPLTSLKSLFGSDPLSQ$
```

Fig. 68B

2003_CON_C_gag.OPT

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ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGCACTACATGCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
AGCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGAAGATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCAAGGCCGCCGACGG
CAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACGCCTGGGTGA
AGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCACCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATG
CTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGT
GCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCGCCT
GGATGACCTCCAACCCCCCCATCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCC
GTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGCG
CCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGCCAAC
AACACCAACATCATGATGCAGCGCTCCAACTTCAAGGGCCCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCCG
CAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCC
TGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACGAGCTGCAGAACCGCCCCGAGCCCACCGCCCCCCCCGCCGAGTCCTTCCGC
TTCGAGGAGACCACCCCCGCCCCCAAGCAGGAGCCCAAGGACCGCGAGCCCCTGACCTCCCTGAAGTCCCTGTTCGGCTCCGACCCCCTGTC
CCAGTAA
```

Fig. 68C

9. 2003_C.anc.gag.PEP

MGARASILRGGKLDTWEKIRLRPGGKKHYMIKHLVWASRELERFALNPGLLETSEGCKQIMKQLQPALQTGTEELRSLYNTVATLYCVHERI
EVRDTKEALDKIEEEQNKSQKTQQAEAADGDNGKVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFTALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QANNTNIMMQRSNFKGPKRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPAE
SRFEETTPAPKQEPKDREPLTSLKSLFGSDPLSQ$

Fig. 68D

2003_C.anc.gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACACCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGCACTACATGAT
CAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATGA
AGCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGCGCATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCCAGAAGACCCAGCAGGCCGAGGCCGCCGACGG
CGACAACGGCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCGAGGTGATCCCGATGTTCACCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCGTGGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGCCTGGATGACCTCCAACCCCCCATCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCATCTCAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCAACAACACCAACATCATGATGCAGCGCTCCAACTTCAAGGGCCCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCA
CATCGCCCGCAACTGCCGCGCCCGCAGGAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
TCCTTCCGCTTCGAGGAGACCACCCCCGCCCCCAAGCAGGAGCCCAAGGACCGCGAGCCCCTGACCTCCCTGAAGTCCCTGTTCGGCTCCGA
CCCCCTGTCCCAGTAA

Fig. 69A

10. 2003_CON_D gag.PEP

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MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHIVWASRELERFALNPGLLETSEGCKQIIGQLQPAIQTGSEELRSLYNTVATLYCVHERI
EVKDTKEALEKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNANPDCKTILKALGPEATLEEMMTACQGVGGPSHKARVLAEAMS
QATNSAAVMMQRGNFKGPRKIIKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPA
ESFGFGEEITPSQKQEQKDKELYPLTSLKSLFGNDPLSQ$
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Fig. 69B

2003_CON_D gag.OPT

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ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCG
GCCAGCTGCAGCCCGCCATCCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAAGGCCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCGTGGCCCCAGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCAGCAACCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCTCCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGAGGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCTCCCACAAGGCCCGTGTGCTGGCCGAGGCCATGTCC
CAGGCCACCAACTCCGCCGCCGTGATGATGCAGCGCGGCAACTTCAAGGGCCCTCGCAAGATCATCAAGTGCTTCAACTGCGGCAAGGAGGG
CCACATCGCCAAGAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCC
AGGCCAACTTCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCGCC
GAGTCCTTCGGCTTCGGCGAGGAGATCACCCCCTCCCAGAAGCAGGAGCAGAAGGACAAGGAGCTGTACCCCCTGACCTCCCTGAAGTCCCT
GTTCGGCAACGACCCCCTGTCCCAGTAA
```

Fig. 70A

11. 2003_CON F gag.PEP

```
MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALDPGLLETSEGCQKIIGQLQPSLQTGSEELRSLYNTVAVLYCVHQKV
EVKDTKEALEKLEEEQNKSQKTQQAAADKGVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNTML
NTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIQWMTSNPPVPVGDIYKRWIILGLNKIVRMYSPV
SILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILKALGPGATLEEMTACQGVGGPGHKARVLAEAMSQATN
TAIMMQKSNFKGQRRIVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAESFGF
REEITPSPKQEQKDEGLYPPLASLKSLFGNDP$
```

Fig. 70B

2003_CON F gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGGACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCAGAAGATCATCG
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCGTGCTGTACTGCGTGCACCAGAAGGTG
GAGGTGAAGGACACCAAGGAGGCCCTGGAGAAGCTGGAGGAGGAGCAGAACAAGTCCCAGAAGACCCAGCAGGCCGCCGCCGACAAGGGC
CGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACGCCTGGGTGAAGG
TGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATGCTG
AACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGTGCA
CGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGTGGGCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCCAGTGGA
TGACCTCCAACCCCCCCGTGCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCGTG
TCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCACCCA
GGAGGTGAAGGGCTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGGGCCCCGGCGCCA
CCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGCCACCAAC
ACCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCAGCGCCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCAAGAA
CTGCCGCGCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCCGCGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCTGCCGCCGAGTCCTTCGGCTTC
CGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCAGAAGGACGAGGGCCTGTACCCCCCCCTGGCCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTAA
```

Fig. 71A

12. 2003_CON_G gag.PEP

```
MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALNPDLLETAEGCQQIMGQLQPALQTGTEELRSLFNTVATLYCVHQRI
EVKDTKEALEEVEKIQKKSQQKTQQAAMDEGNSSQVSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRMHPQQAGPIPPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILRALGPGATLEEMTACQGVGGPSHKARVLAEAMS
QASGAAAIMMQKSNFKGPRRTIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQNRPEPTAPP
AESFGEEIAPSPKQEQKEKELYPLASLKSLFGSDP$
```

Fig.71B

2003_CON_G gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGGCAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGACCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGGAGGTGGAGAAGATCCAGAAGAAGTCCAGCAGAAGACCCAGCAGGCCGCCATGGACGAGGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCAT
GCACCCCCAGCAGGCCGGCCCCATCCCCCCCGGCCAGATCCGCGAGCCCCGTGGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCCGCTGGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGTCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGGGCTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCTCCGGCGCCGCCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCCCCGCCGCACCATCAAGTGCTTCAACTGCGGCAAGGA
GGGCCACCTGGCCCGCAACTGCCGCGCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGC
GCCAGGCCAACTTCCTGGGCAAGATCTGGCCGAGCAACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCCC
GCCGAGTCCTTCGGCGAGGAGATCGCCCCCAGCCCCAAGCAGGAGCAGAAGGAGAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTC
CCTGTTCGGCTCCGACCCCTAA
```

Fig. 72A

13. 2003_CON_H_gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCLQIIEQLQPAIKTGTEELQSLFNTVAVLYCVHQRI
DVKDTKEALGKIEEIQNKSQQKTQQAAADKEKDNKVSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NAMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIAWMTGNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIKQGPKEPERDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGQGASIEEMTACQGVGGPSHKARVLAEAMS
QVTNANAAIMMQKGNFKGPRKIVKCFNCGKEGHIARNCRAPRKKGCWKCGREGHQMKDCTERQANFLGKIWPSSKGRPGNFLQSRPEPTAPP
AESFGFGEEMTPSPKQELKDKEPPLASLRSLFGNDPLSQ$

Fig. 72B

2003_CON_H_gag.OPT

ATGGGCGCCCGCGCCTCCGTCCTGTCTGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCTGCAGATCATCG
AGCAGCTGCAGCCCGCCATCAAGACCGGCACCGAGGAGCTGCAGAGCCTGTTCAACACCGTGGCCGTGCTGTACTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGGCAAGATCGAGGAGATCCAGAACAAGTCCAGAGCCAGAGGCCATCTCCCCCGCCACCCTGAACG
GAAGGACAACAAGGTGTCCCAGAACTACCCCGAGTGATCCCGAGTGATCCCCGAGTGTTCTCCCCTGTCCGAGGGCCACCCCCAGGACCTG
CCTGGGTGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTG
AACGCCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCTGGCACCACTACAAGCGCTGGATCATC
AGATGCCTGGATGACCGCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCGAGCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
TACTCCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCGAGCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCCAGGGCGCCTCCATCGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGACCAACGCCAACGCCGCCATCATGATGCAGAAGGGCAACTTCAAGGGCCCCCGCAAGATCGTGAAGTGCTTCAACTGCGGCAAGGA
GGGCCACATCGCCCGCAACTGCCGCGCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCCGCGAGGGCCACCAGATGAAGGACTGCACCGAGC
GCCAGGCCAACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCTGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCC
GTTCGGCAACGACCCCCTGTCCCAGTAA

Fig. 73A

14. 2003_CON_K gag.PEP

```
MGARASVLSGGKLDTWEKIRLRPGGKKKYRLKHLVWASRELERFALNPSLLETTEGCRQIIRQLQPSLQTGSEELKSLFNTVATLYCVHQRI
EVRDTKEALDKLEEQNKSQQKTQQETADKGVSQNYPIVQNLQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNTML
NTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQITWMTSNPPVPVGEIYKRWIILGLNKIVRMYSPV
SILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTDTLLVQNANPDCKTILKALGPGASLEEMMTACQGVGGPGHKARILAEAMSQVTN
TAVMMQRGNFKGQRKIIKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAESFGF
GEEITPSPRQETKDKEQPPLTSLKSLFGNDPLSQ$
```

Fig. 73B

2003_CON_K gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACACCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCACCGAGGGCTGCCGCCAGATCATCC
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGCTGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGAGACCGCCGACAAGGG
CGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCCTGTCCCCGAGGGCCCACCCTGAACGCCTGGGTGAAGG
TGATCGAGGAGAAGGCCTTCTCCCCGGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATGCTG
AACACCGTGGGCGGCCATCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGTGCA
TGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCACCTGGA
TGACCTCCAACCCCCCGTGCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCGTG
TCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCACCCA
GGAGGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGGGCCCCGGCGCCT
CCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCAGGCCACAAGGCCCGCATCCTGGCCGAGGCCATGTCCCAGGTGACCAAC
ACCGCCGTGATGATGCAGCGCGGCAACTTCAAGGGCCAGAGGAAGATCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCCGCAA
CTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGCCGAGTCCTTCGGCTTC
GGCGAGGAGATCACCCCCTCCCCGCGCCAGGAGACCAAGGACAAGGAGCAGCCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCCTGTCCCAGTAA
```

Fig. 74A

15. 2003_CON_01_AE gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALNPGLLETAEGCQQIIEQLQSTLKTGSEELKSLFNTVATLWCVHQRI
EVKDTKEALDKIEEVQNKSQKTQQAAAGTGSSSKVSQNYPIVQNAQGQMVHQPLSPRTLNAWVKVVEEKGFNPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKETINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNANPDCKSILKALGTGATLEEMMTACQGVGGPSHKARVLAEAMS
QAQHANIMMQRGNFKGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFPQSRPEPTAPPAEN
WGMGEEITSLPKQEQKDKEHPPPLVSLKSLFGNDPLSQ$

Fig. 74B

2003_CON_01_AE gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGCGGCAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATCG
AGCAGCTGCAGTCCACCCTGAAGACCGGCAGCGAGGAGCTGAAGTCCCTGTTCAACACCGTGGCCACCCTGTGGTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGTGCAGAACAAGTCCCAGAAGACCCAGCAGGCCGCCGCCGGCACCGG
CTCCTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGCCCCTGTCCCCGCCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGGCTTCAACCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCTGGCACCACGTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCAACAACCCCCCCATCCCCGTGGGCGATGACCGGCTTCGCCGAGAACCGCACCCTTCGCCGACTACGTGGACCGCCGA
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGAAGGCCCTGG
GCACCGGCGCCACCCTGGAGGAGATGATGACCGCGTGCCAGGGCGTGGGCGGCCCAGCCCACTTCAAGGCGCAAGGAGGCCACCT
CAGGGCCCCAGCAACTGGAGGGCGGCCTCCAACAAGGGCCTCAACAAGGGCCTCAACAAGGCCCCGGCAACTTCCCCCAGTCCCGGCCCGAGAAC
ACTTCCTGGCCAAGATCTGGCCCTCCAACAAGGGCCGCCCAGGGAGATCTGCCCCCCCCCCGTGTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

Fig. 75A

16. 2003_CON_02_AG gag.PEP

```
MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIMEQLQSALRTGSEELKSLYNTVATLWCVHQRI
DIKDTKEALDKIEEVQNKSKQKTQQAAAATGSSSQNYPIVQNAQGQMTHQSMSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNMM
LNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIVLGLNKIVRMYSP
VSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTETLLVQNANPDCKSILRALGPGATLEEMMTACQGVGGPHKARVLAEAMSQVQ
QSNIMMQRGNFRGQRTIKCFNCGKEGHLARNCKAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAESFGM
GEEITSSPKQEPRDKGLYPPLTSLKSLFGNDP$
```

Fig. 75B

2003_CON_02_AG gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCTGCGGCCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
AGCAGCTGCAGTCCGCCCTGCGCACCGGCTCCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCACCCTGTGGTGCGTGCACCAGCGCATC
GACATCAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGTGCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCGCCGCCACCGG
CTCCTCCTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGACCCACCAGTCCATGTCCCCCGTCCGGACGCTGAACGCCTGGGTGA
AGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTGAACATGATG
CTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGTGCACCCCGT
GCACGCCGGCCCCATCCCCCCCGGCCAGATCCGCGAGCCTCGGAGGCTCAACAGCGCCCTGACAGCCGCTGCTGGCCGGAGCAGATCGGCT
GGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCGTGCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCC
GTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGGGCCCCGGCG
CAGTCCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGTGCAG
CTGCAAGGCCAACATCATGATGCAGCGCGGCAACTTCCGCGGCCAGCGCACCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCTGGCCCGCAA
CTGCAAGGCCCGCCTCCTCCAAGGCGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGCCGAGTCCTTCGGCATG
GGCGAGGAGATCACCTCCTCCCCCAAGCAGGAGCCCCGCGACAAGGGCCTGTACCCCCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTAA
```

Fig. 76A

17. 2003_CON_03_ABG gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRIKHLVWASRELERFALNPSLLETSEGCQQILEQLQPTLKTGSEELKSLYNTVATLYCVHQRI
EIKDTKEALDKIEEIQNKSKQKTQQAATGTGSSSKVSQNYPIVQNAQGQMTHQSMSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRLHPAQAGPFPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTETLLVQNANPDCKTILRALGSGATLEEMMTACQGVGGPGHKARVLAEAMS
QVQNANIMMQKSNFRGPKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGRIWPSSKGRPGNFPQSRPEPSAPPAEN
FGMGEEITPSLKQEQKDREQHPPSISLKSLFGNDPLSQ$

Fig. 76B

2003_CON_03_ABG gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCAT
CAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCTCCGAGGGCTGCCAGCAGATCCTGG
AGCAGCTGCAGCCCACCCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGATCAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCACCGGCACCGG
CTCCTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGACCCACCAGTCCATGTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGCCCAGGCCGGCCCCTTCCCCCCCGGCCAGATGAGAGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCTATCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCTCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGCAGAACGCCAACATCATGATGCAGAAGTCCAACTTCCGCGGCCCCAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCCGCATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGCCCCGAGCCCTCCGCCCCCCCGGCCGAGAAC
TTCGGCATGGGCGAGGAGATCACCCCCTCCCTGAAGCAGGAGCAGAAGGACCGCGAGCAGCACCCCCCATCTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

Fig. 77A

18. 2003_CON_04 CFX gag.PEP

```
MGARASVLSGGKLDAWERIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQLMEQLQSTLKTGSEELKSLFNTIATLWCVHQRI
DVKDTKEALDKVEEMQNKSKQKTQQAAADTGGSSNVSQNYPIVQNAQGQMVHQSISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRAHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKCLRAEQATQEVKNWMTETLLVQNANPDCKSILKALGTGATLEEMMTACQGVGGPSHKARVLAEAMS
QASNAAAAIMMQKSNFKGQRRIIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGRMWPSSKGRPGNFLQSRPEPTAPP
AESLEMKEETTSSPKQEPRDKELYPLTSLKSLFGSDPLSQ$
```

Fig. 77B

2003_CON_04 CFX gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGCGGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGGTTCGCCCTGAACCCCGGCCTGCTGGAGACAGCCGAGGGCTGCCAGCAGCTGATGG
AGCAGCTGCAGTCCACCCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCAACACCATCGCCACCCTGTGGTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGACAAGGTGGAGGAGATGCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCGCCGACACCGG
CGGCTCCTCCAACGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGTCCATCTCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCATCAAGCCGCTGCTGGACTACGTGGACCGCTTCTTCAAGTGCCTG
CGCGCCGAGCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGAAGGCCCTGG
GCACCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCTTCAAGGGCCATGTCC
CAGGCCTCCAACGCCGCCGCCGCCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCAGCGCCGCATCATCAAGTGCTTCAACTGCGGCAAGGA
GGGCCACCTGGCCCGCAACTGCCGCGCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGC
GCCAGGCCAACTTCCTGGGCCGCATGTGGCCCTCCTCCAAGGGCCGCCCAGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCC
CCTGTTCGGCTCCGACCCCCTGTCCCAGTAA
```

Fig. 78A

19. 2003_CON_06_CPX_gag.PEP
MGARASVLSGGKLDEWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIIEQLQSALKTGSEELKSLYNTVATLYCVHQRI
KVTDTKEALDKIEEIQNKSKQKAQQAAAATGNSSNLSQNYPIVQNAQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMTACQGVGGPGHKARVLAEAMS
QASGTEAAIMMQKSNFKGPKRSIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQNRPEPTAPP
AESFGFGEETAPSPKQEPKEKELYPLASLKSLFGNDP$

Fig. 78B

2003_CON_06_CPX_gag.OPT
ATGGGCGCCCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGAGTGGGAGAAGATCCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCT
AGCAGCTGCAGTCCGCCCTGAAGACTCCGAGGAGCTCGAGAGATCGAGAACAAGTCCAAG
AAGGTGACCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAG
CAACTCCTCCAACCTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGTGTCTCCCCGAGTGTCTCC
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACC
ATCAACGAGGAGGCCGCCGAGTGGGACCGCGT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCGCGAGGCAGCGAC
AGATCGGCTGGATGACCTCCAACCCTGGACATCCCCCCGCCTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCATGTCC
CAGGCCTCCGGCACCGAGGCCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCCCAAGCGCTCCATCAAGTGCTTCAACTGCGGCAAGGA
GGGCCACCTGGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGC
GCCAGGCCCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCCCCC
GCCGAGTCCTTCGGCTTCGGCGAGGAAGAGACCGCCCCCCAGCCAGAAGCAGGAGAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTC
CCTGTTCGGCAACGACCCCTAA

Fig. 79A

20. 2003_CON_07_BC gag.PEP

```
MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLQPALQTGTEELRSLFNTVATLYCVHTEI
DVRDTKEALDKIEEEQNKIQKTQQAKEADGKVSQNYPIVQNLQGQMVHQPISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTM
LNTVGGHQAAMQILKDTINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSNLQEQIAWMTSNPPVPVGDIYKRWIILGLNKIVRMYSP
TSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGASIEEMMTACQGVGGPSHKARVLAEAMSQTN
STILMQRSNFKGSKRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEESFRF
GEETTTPSQKQEPIDKELYPLTSLKSLFGNDPSSQ$
```

Fig. 79B

2003_CON_07_BC gag.OPT

```
ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCGGCGGCAAGAAGCACTACATGCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
AGCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACACCGAGATC
GACGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGATCCAGAAGACCCAGCAGGCCAAGGAGGCCGACGG
CAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGCCCATCTCCCCGCGCACCCTGAACGCCTGGGTGA
AGGTGGTGGAGGAGAAGGCCTTCAGCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATG
CTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATCCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGT
GCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCAACCTGCAGGAGCAGATCGCCT
GGATGACCTCCAACCCCCCGTGCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCGCGCATGTACTCCCCC
ACCTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGCG
CCTCCATCGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCTCGCGTGCTCAACGTGCTTCAACTGCGGCAAGGAGGGCCACAAAC
TCCACCATCCTGATGCAGCGCTCCAACTTCAAGGGCTCTGGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAA
CTGCCGCGCCCCCCGAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGAGGAGTCCTTCCGCTTC
GGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACAAGGAGCTGTACCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTCCTCCCAGTAA
```

Fig. 80A

21. 2003_CON_08_BC_gag.PEP

MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLQPALQTGTEELRSLFNTVATLYCVHAEI
EVRDTKEALDKIEEEQNKIQQKTQQAKEADEKVSQNYPIVQNLQGQMVHQPLSPRTLNAWVKVVEEKAFSPEVIPMFTALSEGATPQDLNTM
LNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSP
TSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGASLEEMMTACQGVGGPSHKARVLAEAMSQTN
NTILMQRSNFKGSKRIVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPAESFRF
EETTPAPKQEPKDREPLTSLRSLFGSDPLSQ$

Fig. 80B

2003_CON_08_BC_gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCGGCGGCAAGAAGCACTACATGCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
AGCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACGCCGAGATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGATCCAGCAGAAGACCCAGCAGGCCAAGGAGGCCGACGA
GAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGCCCCTGTCCCCGAGGGCGCCACCCCCAGGACCCTGGGTGA
CTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGT
GCACGCCGGCCCCGTGGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCGGCT
GGATGACCAACAACCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCC
ACCTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGACGTGAAGAACTGGATGACCGACCGCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGCG
CCTCCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCGCCATGTGCGGCAAGGAGCGCGTGCTGGCCGAGGCCATGTCCCAGACCAAC
AACACCATCCTGATGCAGCGCTCCAACTTCAAGGGCTCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCAAGAA
CTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCGCCGGAGTCCTTCCGCTTC
GAGGAGACCACCCCCGCCCCCAAGCAGGAGCCCAAGGACCGCGAGCCCCTGACCTCCCTGCGCTCCCTGTTCGGCTCCGACCCCCTGTCCCA
GTAA

Fig. 81A

22. 2003_CON_10_CD_gag.PEP

MGARASVLSGGKLDEWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEGCKQIIGQLQPAIQTGSEEIKSLYNTVATLYCVHERI
KVTDTKEALDKIEEEQTKSKKKAQQATADTGNSSQVSQNYPIVQNLQGQMVHQPLSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVQAGPVAPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPSHKARVLAEAMS
QATSGNAIMMQRGNFKGPKKIIKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCTERQANELGKIWPSNKGRPGNFLQSRPEPTAPPA
ESFGFGEEITPSQKQEQKDKELHPLASLKSLFGNDPLSQ$

Fig. 81B

2003_CON_10_CD_gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGAGTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCG
GCCAGCTGCAGCCCGCCATCCAGACCGGCTCCGAGGAGATCAAGTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGCGCATC
AAGGTGACCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGACCAAGTCCAAGAAGAAGGCCCAGCAGGCCACCGCCGACACCGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGCCCCTGTCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGAGCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTG
CACCCCGTGCAGGCCGGCCCCGTGGCCCCCGGCCAGATCCGCGAGCCCCGTGGGCGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTT
CTACAAGACCCTGCGCGCCGAGCAGGCCTCCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAG
ACCATCCTGAAGGCCCTGGGCCCCGCCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCTCCCACAAGGCCCGCGTG
CTGGCCGAGGCCATGTCCCAGGCCACCTCCGGCAACGCCATCATGATGCAGCGCGGCAACTTCAAGGGCCCCAAGAAGATCATCAAGTGCTTC
AACTGCGGCAAGGAGGGCCACATCGCCAAGAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCCGCGAGGGCCACCAGATGAAG
GACTGCACCGAGCGCCAGGCCAACGAGCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCC
ACCGCCCCGGCCGAGTCCTTCGGCTTCGGCGAGGAGATCACCCCCTCCCAGAAGCAGGAGCAGAAGGACAAGGAGCTGCACCCCCTGGCCTCC
CTGAAGTCCCTGTTCGGCAACGACCCCCTGTCCCAGTAA

Fig. 82A

23. 2003_CON_11_CPX gag.PEP

```
gag.PEPMGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPSLLETAEGCQQIMGQLQPALGTGTEELRSLYNTVATL
YCVHHRIEVKDTKEALDKIEEIQNKSKQKKQQAAADTGNSSKVSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSE
GATPQDLNMMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTGNPPVPVGEIYRRWIILG
LNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKSWMTETLLIQNANPDCKSILRALGPGATLEEMMTACQGVGGPGHKAR
VLAEAMSQVQQTNIMMQRSNFKGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFLQSRPEP
TAPPAESFGFGEEIAPSPKQEPKEKELYPLTSLKSLFGSDPLSQ$
```

Fig. 82B

2003_CON_11_CPX gag.OPT

```
ATGGGCGCCCGCGCCGTCCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCCCTGGGCACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCACCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGAAGCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGAGCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGTGGGCCGAGATCTACCGCCGCTGGATCATCCTGGGCCTGCATG
AGATCGGCTGGATGACCGGCAACCCCCCGGTGCCCGTGGGCGAGATCTACCGCCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGTCCTGGATGACCGAGACGCTGCTGATCCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGCAGCAGACCAACATCATGATGCAGCGCTCCAACTTCAAGGGCCAGAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCGAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCTGCAGAGCCGCCCCGAGCCC
CTCCGGCTTCGGCGAGGAGATCGCCCCCTCGCCCAAGCAGGAGCCCAAGGAGAAGGAGCTGTACCCCCTGACCTCCCTGAAGTCCCTGTTCGG
CTCCGACCCCCTGTCCCAGTAA
```

Fig. 83A

24. 2003_CON_12_BF.gag.PEP

MGARASVLSGGELDRWEKIRLRPGGKKKYRLKHIVWASRELERFAVNPGLLETSEGCRKIIGQLQPSLQTGSEELRSLYNTIAVLYFVHQKV
EVKDTKEALDKLEEEQNKSQQKTQQAAADKGVSQNYPIVQNLQGQMVHQALSPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTML
NTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIQWMTSNPPVPVGEIYKRWIILGLNKIVRMYSPV
SILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMSQVTN
TTVMMQKSNFKGQRRIVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCTERQANFLGKIWPSNKGRPGNFLQNRPEPTAPPAESFGF
GEEITPSPKQEQKDEGLYPPLASLKSLFGNDP$

Fig. 83B

2003_CON_12_BF.gag.OPT

ATGGGCGCCCGCCGCCTCCGTGCTGTCCGGCGGCGAGCTGGACCGCTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCAAGATCATCG
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCATCGCCGTGCTGTACTTCGTGCACCAGAAGGTG
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGCTGGAGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCGCCGCCGACAAGGG
CGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCCTGTCCCCGCGCACCCTGAACGCCTGGGTGAAGG
TGGTGGAGGAGAAGGCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATGCTG
AACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGTGCA
CGCCGGCCCGATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCCAGTGGA
TGACCTCCAACCCCCCCGTGCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCGTG
TCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCACCCA
GGAGGTGAAGGGCTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGGGCCCCGGCGCCA
CCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCATGTCCCAGGTGACCAAC
ACCACCGTGATGATGCAGAAGTCCAACTTCAAGGGCCAGCGCCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACGGCCAAGAA
CTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCCGCGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCAGAACCGCCCAGCCCCCCCCGAGTCCTTCGGCTTC
GGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCAGAAGGACGAGGGCCTGTACCCCCCCCTGGCCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTAA

Fig. 84A

25. 2003_CON_14_BG gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALNPDLLETAEGCQQIMGQLQPALQTGTEEIRSLFNTVATLYCVHQKI
EVKDTKEALEEVEKAQKKSQKKQQAAMDEGNNSQASQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLN
TMLNTVGGHQAAMQMLKDTINEEAAEWDRMHPQQAGPIPPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRMY
SPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQ
ASGATIMMQKSNFKGPRRNIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTESKANFLGKIWPSNKGRPGNFLQNRPEPTAPPAES
FGFGEEIAPSPKQEPKEKEIYPLASLKSLFGSDPSSQS

Fig. 84B

2003_CON_14_BG gag.OPT

ATGGGCGCCCGCGCCGTCCTCCGTGCTGCTGTCCGGCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCTGCGCCCTGGGAGGAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGACCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCGCTGCAGACCGGCACCGAGGAGATCCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACCAGAAGATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGGAGGTGGAGAAGGCCCAGAAGAAGTCCCAGAAGAAGCAGCAGGCCGCCATGGACGAGGGCAA
CAACTCCCAGGCCTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGAGGACGCCCTGAACGCC
GGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAAC
ACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGAGTGGGACCGCATGCA
CCCCCAGCAGGCCGGCCCCATCCCCCCCGGCCAGATCCGCGAGCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCGCCGAGCA
TCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCA
GGCCACCCAGGAGGTGAAGGGCTGGATGACCGACCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCC
CCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCTCCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAG
GCCTCCGGCGCCACCATCATGATGCAGAAGTCCAACTTCAAGGGCCCCCGCCGCAACATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGTCCAAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCCCCGCCAGTCC
TTCGGCTTCGGCGAGGAGATCGCCCCTCCCCCAAGCAGGAGCCCAAGGAGAAGGAGATCTACCCCCTGGCCTCCCTGAAGTCCCTGTTCGG
CTCCGACCCCTAATCCCAGTAA

Fig. 85A

31. 2003 CONS nef.PEP

MGGKWSKSSIVGWPAVRERIRRTPPAAEGVGAVSQDLDKHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKGAFDLSHFLK
EKGGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEEANEGENNCLLHPMCQHGMEDEDREVLMWK
FDSRLALRHIARELHPEFYKDC$

Fig. 85B

2003 CONS nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCCGCCGCACCCCCCCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGATGTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 86A

32. 2003 M. GROUP.anc nef.PEP

MGGKWSKSSIVGWPAVRERMRRTAPAAEGVGAVSQDLDKHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKAAFDLSHFLK
EKGGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEEANEGENNCLLHPMCQHGMEDEEREVLMWK
FDSRLALRHIARELHPEFYKDC$

Fig. 86B

2003 M GROUP.anc nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATGCGCCGCACCGCCCCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACGAGGAGCGCGAGGTGCTGATGTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 87A

33. 2003_CON_A nef.PEP
MGGKWSKSSIVGWPDIRERIRRTPPAAKGVGAVSQDLDKYGAVTINNTAATQASCAWLEAQEEEEVGFPVRPQVPLRPMTFKGAFDLSFFL
KEKGGLDGLIYSQKRQEILDLWVYNTQGYFPDWQNYTPGPGTRFPLTFGWCFKLVPVDPDEVEEATEGENNCLLHPICQHGMDDEEKEVLMW
KFDSRLARRHIALEMHPEFYKDC$

Fig. 87B

2003_CON_A nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGACATCCGCGAGCGCATCCGCCGCACCCCCCCGGCCGCCAAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGTACGGCGCCGTGACCATCAACAACACCGCCGCCACCCAGGCCTCCTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGGCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCCAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCACCCGCTTCCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGACGAGG
TGGAGGAGGCCACCGAGGGCGAGAACAACTGCCTGCTGCACCCCATCTGCCAGCACGGCATGGACGACGAGGAGAAGGAGGTGCTGATGTGG
AAGTTCGACTCCCGCCTGGCCCGCCGCCACATCGCCCTGGAGATGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 88A

34. 2003 CON_A1 nef.PEP
MGGKWSKSSIVGWPEVRERMRRTPPAATGVGAVSQDLDKHGAVTSSNINHPSCVWLEAQEEEEVGFPVRPQVPLRPMTYKGALDLSHFLKEK
GGLDGLIYSRKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPDEVEKATEGENNSLLHPICQHGMDDEEREVLKWKFD
SRLALKHRAQELHPEFYKDC$

Fig. 88B

2003_CON_A1 nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGCGCATGCGCCGCACCCCCCCGGCCGCCACCGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCGTGACCTCCTCCAACATCAACCACCCCTCCTGCGTGTGGCTGGAGGCCCAGGAGGAGG
AGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCCTGGACCTGTCCCACTTCCTGAAGGAGAAG
GGCGGCCTGGACGGCCTGATCTACTCCCGCAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGACTGGCA
GAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGCTGACACGCCCCAGGAGCTGCACCCCCGAGTTCTACAAGGACTGCTAA

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Fig. 88C

35. 2003_A1.anc nef.PEP
MGGKWSKSSIVGWPEVRERMRRTPPAAKGVGAVSQDLDKHGAVTSSNTAANNPGCAWLEAQEEEVGFPVRPQVPLRPMTYKGAFDLSHFLK
EKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPAEVEEATEGENNSLLHPICQHGMDDEEREVLMWK
FDSRLALKHRARELHPEFYKDC$

Fig. 88D

2003_A1.anc nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGCGCATGCGCCGCACCCCCGCCGCCAAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCGTGACCTCCTCCAACACCGCCGCCAACAACCCCGGCTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACACCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGCCGAGGTGG
AGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGACGACGAGGAGCGCGAGGTGCTGATGTGGAAG
TTCGACTCCCGCCTGGCCCTGAAGCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 89A

36. 2003_CON_A2 nef.PEP
MGGKWSKSSIVGWPAIRERMRKRTPPAAEGVGAVSQDLATRGAVTSSNTAATNPDCAWLEAQEEEVGFPVRPQVPLRPMTFKGAFDLSHFL
KEKGGLDGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGPGTRYPLTFGWCFKLVPVDPSEVEEATEGENNSLLHPICQHGIEDPEREVLRW
KFDSRLALRHRARELHPEFYKDC$

Fig. 89B

2003_CON_A2 nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGCATGCGCAAGCGCACCCCCCGCCGCCGAGGGCGT
GGGCGCCGTGTCCCAGGACCTGGCCACCCGCGGCGCCGTGACCTCCTCCAACACCGCCGCCACCAACCCCGACTGCGCCTGGCTGGAGGCCC
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGGCGCCTTCGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCCAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCACCCGCTACCCCCTGCTGCACCCCATCTGCCAGCACGGCATCGAGGACCCCGAGCGCGAGG
TGGAGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 90A

37. 2003 CON B nef.PEP

MGGKWSKRSVVGWPTVRERMRRAEPAADGVGAVSRDLEKHGAITSSNTAANNADCAWLEAQEEEVGFPVRPQVPLRPMTYKGALDLSHFLK
EKGGLEGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVEPEKVEEANEGENNSLLHPMSLHGMDDPEREVLVWK
FDSRLAFHHMARELHPEYYKDC$

Fig. 90B

2003_CON-B nef.OPT

ATGGGCGGCAAGTGGTCCAAGCGCTCCGTGGTGGGCTGGCCCACCGTGCGCGAGAGGCGCATGCGCCGCGCCGAGCCCGCCGACGGCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCAACAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGGCGGCCTGGAGGGCCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCCTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCCAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGAGCCCGAGAAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCATGTCCCTGCACGGCATGGACGACCCCGAGCGCGAGGTGCTGGTGTGGAAG
TTCGACTCCCGCCTGGCCTTCCACCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 90C

38. 2003 B.anc nef.PEP

MGGKWSKSSMGGWPAVRERMKRAEPAADGVGAVSRDLEKHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKAALDLSHFLK
EKGGLEGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVEPEKVEEATEGENNSLLHPMCQHGMDDPEKEVLVWK
FDSRLAFHHMARELHPEYYKDC$

Fig. 90D

2003 B.anc nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATGGGCGGCTGGCCCGCCGTGCGCGAGCGCATGAAGCGCGCCGAGCCCGCCGACGGCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCCTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCCAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGAGCCCGAGAAGGTGG
AGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCATGTGCCAGCACGGCATGGACGACCCCGAGAAGGAGGTGCTGGTGTGGAAG
TTCGACTCCCGCCTGGCCTTCCACCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 91A

39. 2003_CON_02_AG nef.PEP
MGGKWSKSSIVGWPKVRERIRQTPPAATGVGAASQDLDRHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKAAVDLSHFLK
EKGGLEGLIYSKKRQEILDLWVYHTQGFFPDWQNYTPGPGTRFPLTFGWCFKLVPMDPAEVEEANEGENNSLLHPICQHGMEDEDREVLVWR
FDSSLAFKHRARELHPEFYKDC$

Fig. 91B

2003_CON_02_AG nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCAAGGTGCGCGAGCGCATCCGCCAGACCCCCCCGGCCGCCACCGGCGTGGG
CGCCGCCTCCCAGGACCTGGACCGCCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCGTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTTCTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCGGGCACCCGCTTCCCCCTGCTGACGCTGCACCATCTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCCATCTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGGTGTGGCGC
TTCGACTCCTCCCTGGCCTTCAAGCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 92A

40. 2003_CON_C nef.PEP
MGGKWSKSSIVGWPAVRERIRRTEPAAEGVGAASQDLDKHGALTSSNTATNNADCAWLEAQEEEEVGFPVRPQVPLRPMTYKAAFDLSFFL
KEKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGVRYPLTFGWCFKLVPVDPREVEEANEGENNCLLHPMSQHGMEDEDREVLKW
KFDSHLARRHMARELHPEYYKDC$

Fig. 92B

2003_CON_C nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCCGCCGCACCGAGCCCGCCGCCGAGGGCGTGGG
CGCCGCCTCCCAGGACCTGGACAAGCACGGCGCCCTCACCTCCTCCAACACCGCCACCAACAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCC
GACTGGCAGAACTACACACCCGGCCCCGGCGTGCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCGCGAGG
TGGAGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGAAGTGG
AAGTTCGACTCCCACCTGGCCCGCCGCCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 92C

41. 2003_C.anc nef.PEP

MGGKWNSKSSIVGWPAVREMRRTEPAAEGVGAASQDLDKHGALTSSNTAANNADCAWLEAQEEEEVGFPVRPQVPLRPMTYKAAFDLSFFL
KEKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGVRYPLTFGWCFKLVPVDPREVEEANEGENNCLLHPMSQHGMEDEDREVLKW
KFDSHLARRHMARELHPEYYKDC$

Fig. 92D

2003_C.anc nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGATGCGCCGGACCGAGCCCGCCGAGGGCGTGGG
CGCCGCCTCCCAGGACCTGGACAAGCACGGCGCCCTGACCTCCTCCAACACCGCCGCCAACAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACACCCGGCCCCGGCGTGCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCGAGG
TGGAGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGAAGTGG
AAGTTCGACTCCCACCTGGCCCGCCGCCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 93A

42. 2003_CON_D nef.PEP

MGGKWSKSSIVGWPAIRERIRRTEPAADGVGAVSRDLEKHGAITSSNTAATNADCAWLEAQEEEEVGFPVRPQVPLRPMTYKAALDLSHFL
KEKGGLEGLVWSQKRQEILDLWVYNTQGFFPDWQNYTPGPGIRYPLTFGWCFELVPVDPEEVEEATEGENNCLLHPMCQHGMEDPEREVLMW
RFNSRLAFEHKARVLHPEFYKDC$

Fig. 93B

2003_CON_D nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGCATCCGCCGGACCGAGCCCGCCGACGGCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACGAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCCTGGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGGTGTGGTCCCAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
CGACTGGCAGAACTACACACCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCGAGCTGGTGCCCGTGGACCCCGAGGAGG
TGGAGGAGGCCACCGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCACAAGGACGACCCCGAGAGGGAGG
CGCTTCAACTCCCGCCTGGCCTTCGAGCACAAGGCCCGCGTGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 94A

43. 2003_CON_F1 nef.PEP

MGGKWSKSSIVGWPAVRERMRPTPPAAEGVGAVSQDLERRGAITSSNTGATNPDLAWLEAQEEEVGFPVRPQVPLRPMTYKGAVDLSHFLK
EKGGLEGLIYSKKRQEILDLWVYHTQYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEKANEGENNCLLHPMSQHGMEDEDREVLIWK
FDSRLALRHIARERHPEFYQD$

Fig. 94B

2003_CON_F1 nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATGCGCCCCACCCCCCCGCCGGCGGCGGTGGG
CGCCGTGTCCCAGGACCTGGAGCGCCGCGGCATCACCTCCTCCAACACCGGCGCCACCAACCCCGACCTGGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCGTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGAAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGATCTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCGCCACCCCGAGTTCTACCAGGACTAA

Fig. 95A

44. 2003_CON_F2 nef.PEP

MGGKWSKSSIVGWPTIRERIRRTPVAAEGVGAVSQDLDKHGAITSSNTRATNADLAWLEAQEDEEVGFPVRPQVPLRPMTYKAAFDLSHFLK
EKGGLEGLIYSKKRQEILDLWVYHTQYFPDWQNYTPGPGTRYPLTFGWCFKLVPVDPEEVEKANEGENNCLLHPMSLHGMEDEDREVLKWK
FDSRLALRHIARERHPEYYKD$

Fig. 95B

2003_CON_F2 nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCACCATCCGCGAGCGCATCCGCCGCACCCCCGTGGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCCGCGCCACCAACGCCGACCTGGCCTGGCTGGAGGCCCAGG
AGGACGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCACCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGAAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCTGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGAAGTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCGCCACCCCGAGTACTACAAGGACTAA

Fig. 96A

45. 2003_CON_G nef.PEP
MGGKWSKSSIVGWPEVRERIRQTPPAAEGVGAVSQDLARHGAITSSNTAANNPDCAWLEAQEEDSEVGFPVRPQVPLRPMTYKGAFDLSFEL
KEKGGLDGLIYSKKRQDILDLWVYNTQGFEPDWQNYTPGTRFPLTFGWCFKLVPMDPAEVEEANKGENNSLLHPICQHGMEDEDREVLVW
RFDSSLARRHIARELHPEYYKDC$

Fig. 96B

2003_CON_G nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGCGCATCCGCCAGACCCCCCCGGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGCCCGCCATCACCTCCAACAACCCGCCGGCTGCGCGGCGCTGCCTTCGACCTGTCCTTCTTCCTG
AGGAGGACTCCGAGGTGGGCTTCCCGTGCCCCAGTGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCGAACTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
CGACTGGCAGAACTACACACCCCGGCACCCCGGCTTCCCCCCGCTTCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCATGGACCCGCCGAGG
TGGAGGAGGCCAACAAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGGTGTGG
CGCTTCGACTCCTCCCTGGCCCGCCGCCACATCGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 97A

46. 2003_CON_H nef.PEP
MGGKWSKSSIGGWPAIRERIRRAEPAAEGVGAVSRDLDRRGAVTINNTASTNPDSAWLEAQEEEEVGFPVRPQVPLRPMTYKGAFDLSHFL
KEKGGLEGLIYSKKRQEILDLWVYNTQGYEPDWQNYTPGPGERYPLTFGWCFKLVPVDPQEVEKANEGENNSLLHPICQHGMEDEEREVLMW
KFDSRLAFRHIARELHPEFYKDC$

Fig. 97B

2003_CON_H nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGGCGGCTGGCCCGCCATCCGCGAGCGCATCCGCCGCGCCGAGCCCGCCGCCGAGGGCGTGGG
CGCCGTGTCCCGCGACCTGGACCGCCGCGGCGCCGTGACCATCAACAACACCGCCTCCACCAAYCCCGACTCCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACGCCCGGCCCCGGCGAGCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCAGGAGG
TGGAGAAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGAGGACGAGGAGCGCGAGGTGCTGATGTGG
AAGTTCGACTCCCGCCTGGCCTTCCGCCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 98A

47. 2003_CON_01_AE nef.PEP
MGGKWSKSSIVGWPQVRERIKQTPPATEGVGAVSQDLDKHGAVTSSNMNNADCVWLRAQEEEVGFPVRPQVPLRPMTYKGAFDLSFFLKEK
GGLDGLIYSKKRQEILDLMVYNTQGFFPDWQNYTPGPGIRYPLCFGWCFKLVPVDPREVEEDNKGENNCLLHPMSQHGIEDEEREVLMWKFD
SALARKHIARELHPEYYKDC$

Fig. 98B

2003_CON_01_AE nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCCAGGTGCGCGAGCGCATCAAGCAGACCCCCGCCACCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCGTGACCTCCTCCAACATGAACAACGCCGACTGCGTGTGGCTGCGCGCCCAGGAGGAGG
AGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTCCTGAAGGAGAAG
GGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGATGGTGTACAACACCCAGGGCTTCTTCCCCGACTGGCA
GAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGTGCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCGCGAGGTGGAGGAGG
ACAACAAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATCGAGGACGAGGAGCGCGAGGTGCTGATGTGGAAGTTCGAC
TCCGCCCTGGCCCGCAAGCACATCGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 99A

48. 2003_CON_03_AE nef.PEP
MGGKWSKSSIVGWPQVRERIRRAPAPAARGVGPVSQDLDKYGAVTSSNTAANNADCAWLEAQKEEEVGFPVRPQVPLRPMTYKGAFDLSHFL
KEKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRFPLTFGWCYKLVPVDPDEVEEATEGENNSLLHPICQHGMDDEEKEVLMW
KFDSRLALTHRARELHPEFYKDC$

Fig. 99B

2003_CON_03_AE nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCCAGGTGCGCGAGCGCATCCGCCGCGCCCCCGCCCCGGCGCGT
GGGCGTGGGCCCCGTGTCCCAGGACCTGGACAAGTACGGCGCCGTGACCTCCTCCAACACCGCCGCCAACAACGCCGACTGCGCCTGGCTGGAGGCCC
AGAAGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTTCCCCCTGCTGACCTTCGGCTGGTGCTACAAGCTGGTGCCCGTGGACCCCGACGAGG
TGGAGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGACGACGAGGAGAAGGAGGTGCTGATGTGG
AAGTTCGACTCCCGCCTGGCCCTGACCCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 100A

49. 2003_CON_04_CFX_nef.PEP

MGGKWSKSSIVGWPAIRERMRQRGPAQAEPAAAGVGAVSQDLDKHGAITSSNTAATNPDKAWLEAQEEEVGFPVRPQVPLRPMTFKAALD
LSHFLKEKGGLDGLIYSKKRQEILDLWVYNTQGYFPDWQNYTPGPGEREFPLCFGWCFKLVPVDPQEVEEATEGENNCLLHPISQHGMEDEER
EVLKWKFDSRLAYKHIARELHPEFYKDC$

Fig. 100B

2003_CON_04_CFX_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGGATGCGCCAGCGCGGCCCCGCCCAGGCCGAGCCCGC
CGCCGCCGGCGTGGGCGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACCCCGACAAGGCCT
GGCTGGAGGCCCAGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGCCGCCCTGGAC
CTGTCCCACTTCCTGAAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACAC
CCAGGGCTACTTCCCCGACTGGCAGAACTACACCCCCGGCCCCGGCGAGCGCTTCCCCTGTGCTTCGGCTGGTGCTTCAAGCTGGTGCCCG
TGGACCCCCAGGAGGTGGAGGAGGCCACCGAGGGCGAGAACAACTGCCTGCTGCACCCCATCTCCCAGCACGGCATGGAGGACGAGAGCGC
GAGGTGCTGAAGTGGAAGTTCGACTCCCGCCTGGCCTACAAGCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 101A

50. 2003_CON_06_CFX_nef.PEP

MGGKWSKSSIVGWPQVRERMRRNPPTEGAAEGVGAVSQDLDKHGAITSSNTATTNAACAWLEAQTEDEVGFPVRPQVPLRPMTYKGAFDLSFF
LKEKGGLDGLIYSKKRQEILDLWVYHTQGFPGIRYPLTFGWCYKLVPVDPKEVEEDTKGENNCLLHPMCQHGVEDEEREVLM
WKFDSSLARRHIAREMHPEFYKDC$

Fig. 101B

2003_CON_06_CFX_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCCAGGTGCGCGAGCGGATGCGCCGCAACCCCCCCACGGAGGGCGCCGAGGG
CGTGGGCGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCACCACCAACGCCGCCTGCGCCTGGCTGGAGG
CCCAGACCGAGGACGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTC
CTGAAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTTCTT
CCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTACAAGCTGGTGCCCGTGGACCCCAAGG
AGGTGGAGGAGGACACCAAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCGTGGAGGACGAGGAGCGCGAGGTGCTGATG
TGGAAGTTCGACTCCTCCCTGGCCCGCCGCCACATCGCCCGCGAGATGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 102A

51. 2003_CON_08_BC_nef.PEP

MGGKWSKSSIVGWPAIRERIRRTEPAADGVGAVSRDLEKHGAITSSNTADTNADCAWLETQEEEEVGFPVRPQVPLRPMTFKGALDLSFFLK
EKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWHNYTPGPGVRFPLTFGWCFKLVPVDPREVEEANEGEDNCLLHPVCQHGMEDEHREVLKWK
FDSQLAHRHRARELHPEFYKDC$

Fig. 102B

2003_CON_08_BC_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGCATCCGCCGCACCGAGCCCGCCGCCGACGGCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCAACACCGCCGACACCAACGCCGACTGCGCCTGGCTGGAGACCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGGCGCCCTGGACCTGTCCTTCTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCACAACTACACCCCCGGCCCTTCCCCGGCGTGCGCTTCCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCGAGGTGG
AGGAGGCCAACGAGGGCGAGGACAACTGCCTGCTGCACCCCGTGTGCCAGCACGGCATGGAGGACGAGCACCGCGAGGTGCTGAAGTGGAAG
TTCGACTCCCAGCTGGCCCACCGCCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 103A

52. 2003_CON_10_CD_nef.PEP

MGGKWSKSSIVGWPAVRERIRRTDPAAEGVGAASRDLEKYGAITSSNTAQTNPDCAWLEAQEEEEVGFPVRPQVPLRPMTYKGAFDLSFFL
KEKGGLEGLIYSKRRQDILDLWVYNTQGFFPDWQNYTPGPGIRYPLTFGWCYKLVPVDPREVEEANEGENNSLLHPMSLHGMEDPHGEVLMW
KFDSNLAHKHMARELHPEYYKDC$

Fig. 103B

2003_CON_10_CD_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCCGCCGCACCGACCCCGCCGCCGAGGGCGTGGG
CGCCGCCTCCCGCGACCTGGAGAAGTACGGCGCCATCACCTCCAACACCGCCCAGACCAACCCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGCGCCGCCAGGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTACAAGCTGGTGCCCGTGGACCCCCGCGAGG
TGGAGGAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCATGTCCCTGCACGGCATGGAGGACCCCCACGGCGAGGTGCTGATGTGG
AAGTTCGACTCCAACCTGGCCCACAAGCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 104A

53. 2003_CON_11_CFX_nef.PEP

MGGKWSKSSIVGWPEIRERLRRTPPTAAAEGVGAVSKDLEKHGAVTSSNTAQTNAACAWLEAQEEEVGFPVRPQVPLRPMTYKGAFDLGFF
LKEKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLCFGWCFKLVPVEPREVEEANEGENNCLLHPMSQHGMDDEEREVLM
WKFDSSLARRHIARELHPDFYKDC$

Fig. 104B

2003_CON_11_CFX_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGAGATCCGCGAGCGCCTGCGCCGCACCCCCACCGCCGCCGCCGAGGG
CGTGGGCGCCGTGTCCAAGGACCTGGAGAAGCACGGCGCCGTGACCTCCTCCAACACCGCCCAGACCAACGCCGCCTGCGCCTGGCTGGAGG
CCCAGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGGGCTTCTTC
CTGAAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTT
CCCCGACTGGCAGAACTACACCCCCGGCATCCGCTACCCCCTGTGCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGAGCCCCGCG
AGGTGGAGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGACGACGAGGAGCGCGAGGTGCTGATG
TGGAAGTTCGACTCCTCCCTGGCCCGCCGCCACATCGCCCGCGAGCTGCACCCCGACTTCTACAAGGACTGCTAA

Fig. 105A

54. 2003_CON_12_BF_nef.PEP

MGGKWSKSSIVGWPDIRERMRRAPPAAEGVGAVSQDLENRGAITSSNTRANNPDLAWLEAQEEEVGFPVRPQVPLRPMTYKGALDLSHFLK
EKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEKANEGENNCLLHPMSQHGMEDEDREVLMWK
FDSRLALRHIAREKHPEFYQDC$

Fig. 105B

2003_CON_12_BF_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGACATCCGCGAGCGCATGCGCCGCGCCCCCCCGGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGAGAACCGCGGCGCCATCACCTCCTCCAACACCCGCGCCAACAACCCCGACCTGGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCCTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCATCCGCTACCCCCTGCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGAAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGATGTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGAAGCACCCCGAGTTCTACCAGGACTGCTAA

Fig. 106A

55. 2003_CON_14_BG_nef.PEP

MGGKWSKCSIVGWPEVRERIRRTPPAAVGVGAVSQDLAKHGAITSSNTAANNPDCAWLEAQEEDSEVGFPVRPQVPLRPMTYKGAFDLSFFL
KEKGGLDGLIYSKQRQDILDLWVYNTQGFFPDWQNYTPGPGTRYPLTFGWCFKLEPVDPAEVEEATKGENNSLLHPICQHGMEDADNEVLIW
RFDSSLARRHIARELHPDFYKDC$

Fig. 106B

2003_CON_14_BG_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTGCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGCGCATCCGCCGCACCCCCCCGGCCGCCGTGGGCGTGGG
CGCCGTGTCCCAGGACCTGGCCAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCAACAACCCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGACTCCGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGCAGCGCCAGGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
CGACTGGCAGAACTACACCCCCGGCCCGGGCACCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGAGCCCGTGGACCCCGCCGAGG
TGGAGGAGGCCACCAAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGAGGACGCCGACAACGAGGTGCTGATCTGG
CGCTTCGACTCCTCCCTGGCCCGCCGCCACATCGCCCGCGAGCTGCACCCCGACTTCTACAAGGACTGCTAA

Fig. 107A

61. 2003_2003_CON_S_pol.PEP

FFRENLAFQQGEAREFSSEQTRANSPTSRELRVRGGDNPLSEAGAERQGTVSLSFPQITLWQRPLVTVKIGGQLKEALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTQNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWGF
TTPDKKHQKEPPFLMMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIATESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELQAIHLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGIDKAQEHEKYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGIGGYSAGERIIDIIAT
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 107B

2003_CON_s pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGCGGAGGCCCCGGAGTTCTCCTCGAGCAGACCCGCGCCAACTCCCCACCTCCCGCGAGCTGCGCGTGCG
CGGCGGCGACAACCCCCTGTCCGAGGCGGCCGAGCGCCAGGGCCGGCCGGCCGCCCAGATCACCCTGTGGCAGCCCCTGGTGACCG
TGAAGATCGGCGGCCAGCTGAAGGAGGCCCTGCTGGACGACACCGTGCCGACGACCAGATCCTGACCCTGGGAGGAGATCAACCTGCCCGGCCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCGAAGGTGCGCCAGTACGACCAGATCCTGATCGAGCTGGGCAAGAAGGCCATCGAGACCGTGCCGTGGTGGGCCCCAC
CCCGTGAACATCATCGGCCGCAACATGCTGACCCCAGGTGGCCCCTGACCCTGACCCTGAACTTCCCCATCGAGACTTCCCCCATCGAGACCGTGGAAGCTGAAGCCCG
GCATGGACGACGCGGCCCCAAGGTGAAGCAGTGGCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACACACACCCCATCTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GCGCACCCAGGACTTCTGGGAGGTGCAGCTTCCGCAAGTACACCGCCTTCACGATCCTTCCAGTCGAGACCGTGCCGTGCCTACCAGTA
TCTCCGTGCCCCTGGACGAGGACTTCCCCCGCCATCTTCCAGTCTTCCAGTACCCGAGATCGTGATCTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCCGACCTGGGCTCCGAGAGATCGGCACCGTGCGCGGCTTCACCACCC
CATGGACGACGCTGTACGTGGGCTCCGACCTGACGCTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGACCCCGACATCTACCCGAGATCGTGCGCTGGGCTTCACCACCC
CCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGCCCGAGAAGGAC
TCCTGGACCGTGAACGACATCCAGAAGCTGTGTGGGCCCCTGACCGAGGAGCTGAACCTGTCTGCAAGCAGCTGTGCAAGCTGCTGCG
CGGCGCCAAGGCCCTGACCGACCAGATCCTGCGCCAGGAGATCCTACCAGGAGATCTACCAGGAGACCTACCAGGAGACCTGAAGAACCTGAAGACC
ACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGGAGCAGGGCGACCAGAGTCCATCGTGATCTGGGCCAA
GGCAAGTACGCCAAGATGCGCTCCGCCCACAACCAAACGACGCCGTGAAGCAGTGGATGGCCGTGAAGCTGGGGCAA
GACCCCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGAGAAGATCGCGCCACCTGGATCCCGGATCCCGCGCACCTGGAACA
CCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCGTGCTCCGAGTACTGGGAGAAGTTCGTGAACA
GGCAAGGCCGGCCGGTGAACGTGTCCGAGGTGAACATCGTGACCGCGCCGAGACCATCATCCAGGCCATCCACCTGCCCCT
GCGAGGACTCCGGCTCCGAGGTGAACATCGTGACCGCGCCGAGACCAGAAGACCCAGCCCGACAAGTCCGAGCTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGAGGACGCACAGGGCCCCAGGAGGCAGAGAAGCTGGTGTCC
ACCGGCATCAGCTGTCGTTCCTGTGACGGCCTCGAGGGCAAGATCATCCTGCGCGCTCGAGGTGCAGGGCCTGAAGGTGAAGCTTCACCTGGCCCCT
CCTGCCCCCCCACCTGGACCTGGAGGGCAAGAGATCATCCTGGCCTGGCGCCTGGAGAGCACGAGAGAAGTGCCAAGTGGATCAA
GGCAGCTGCAGCTGCAAGGTGCTGGACCTGGAGGGCAAGATCCTGGCCCTGGGCGCGCCGGTGATCCCGCGCGAGACCGGC
CAGGAGACCGCCTACTTCGTGCTGGAGGGCAATCCAGCAGGTTCGGCATCCAGGAGGTTCGGCATCGAGGTGGGGTTCATCCACGCTACTCC
CGCTGGTCGGTGGGCGCGACCAGGCCGAGCATCATGGCCGGCATCAGCCCCTACAACACCCGCGCCGTGAAGGGCGGCATCGGCGGCTACTCC
GCCGGCGAGCGCATCATCGACACAATCATCGCCACCAGCAAGTCCGAGAAGGCGGCCCAAGGGCGGCATCGGCGGCTGTACTACCGCGA
CTCCCCCGACCCCATCTGGAAGCCGACTACGGCAAGCAGAGATGCCGGCGGCGACTACGGCAAGATCAAGGTGGTGTGCCCCGCC
GCAAGGCCCAAGATCATCCGCGGCAAGTACGGCGGCGACTACGGCAAGCAGGACGAGGACTAA

Fig. 108A

62 2003 M GROUP anc pol.PEP

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FFRENLAFQQGEAREFSSEQTRANSPTSRELRVRGGDNPLSEAGAERQGTVSFSFPQITLWQRPLVTIKIGGQLREALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIATESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELQAIHLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAT
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 109A

63. 2003_CON_A1 pol.PEP

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FFRENLAFQQGEARKFSSEQTGANSPTSRDLMDGGRDSLPSEAGAERQGTPTFSFPQITLWQRPLVTVRIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
ESFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRSKNPEIIYQYMDDLYVGSDLEIGQHRTKIEELRAHLLSWG
NREILKDPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYARKRSAHTNDVKQLAEVVQKVVMESIVIWGKTPKFKLPIQKET
GSEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIGKDKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRA
HTDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 108B

2003_M.GROUP anc pol.OPT

TTCTTCCGGAGGAACCTGGCCTTCCTCCGAGCAGGAGCCCGCGAGTTCTCTCCGAGCAGCAGACCCGGCCAACTCCCCACCTCCCGCGAGCTGCCGGTGCG
CGGCGGCGACAAACCCCGTCCGGAGGCGGCGCCGAGCGCCCAGGGCACCGTGCTGGCCAGCGCCCCCTCCTTCCCCAGATCACCCCTGTGGCAGCGCCCCCTGGTGACCA
TCAAGATCGGCGGCGCCGAGCTGCCGCAGCTGCCCTGCTGGACAGATCGGCGGCGGCCGTGCTGGACGACACCGGCCAAGTGACCAACTCGCCCGGCAGATCAACCGGAGCCCAAGATG
ATCGGCGGCATCGAGCGGCTTCATCAAGTGCCGCCAGTACGACCGAGATCCTGATCGAGATCTGCGGCAAGAAGGCCATCGGCCACCGTGCTGGCCCCGTGGGCCCAC
CCCCGTGAACACATCATCGGCCCGCAACATGCTGGCCGCCCCCAAGGTGAACCAGTGGCCCCTGACCGAGGAGGAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACAACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GCGCACCCAGGAGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCCCGGCCAAGTAGCACCGCCTTCACCATCCCCTTCAACAAGCGCTCCATCAACCCCTCTGGAGCCCCCCGGCCTACT
TCTCCGTGCCCCTGGACGAGGAGGGCTCCCCCCGTGCTGCCAAGAGTACACCGCCTTCCGCCAGATCCTGACCACCGCCGCGAGAGCTGCGCGAGCTTCACCACCC
CCCAGGGCTGGAAGGGCCCTGACGAGCTGTGGATGGGCAAGCTGGTGGCCCCTGAACTGGGCCGAGCCCCTGGAGCGCCGGGGAGATCGTGATCTGGGGCAA
CATGGACGACCTGTACGTGGGCTCCGGAGATCGGCACACCTGGAGAGATGGCGCCCAGAGATCTGCCCGAGATCGGCCAAGAGTCGATCTGCCGAGAAGGAC
CCGACAAGAAGCACCAGAAGGAGCGCCCCCCTTCCTGTGGAGATCGGCCAGCTGGACCGTGAACTGGGCCCTCCCAGATCTACCCCGAGAACTGCCCGAGAGCTGCTGCG
CGGCGGCCAAGGCCCTGAACTGGCCTGACCGAGCTGGACGCCGAGCTGGCCGAGATCCAGGAGGCCGTGAAGCAGTGTGCAAGGCCCGTGCACGGCGTGT
ACTACGACCCCTCCAAGGACCTGATCGCCGCCCACACCACCCAGAAGCAGGGCGACGAGTGGGACTACCAGGAATCGGCCAGTCGATCGTGATCTGGGGCAA
GGCAAGTACGCCGCCAAGATGCCGCTCCGCCCCACCCACCAACGACGTGGGCGAGCAGCTGAAGCAGCCGTGACCGAGCTGACCGAGAAGATCGTGATCTGGGGCAA
GACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAAGCCGCCATCTGGCAGGCCCACTGGATCGGCGCGCCACCTGGATCGGCGCCCAACCGCGAGACCAAGCTG
CCCCCCCCCTGGTGAAGCTGTGTGTACCAGCTGGAGAAGGAGCCCATCGTGGGGCGCGCCGCCAGAAGGTGTCCCTGACCGAAGAGGTGTCCCTGAGACCAGAGAGAACCGAGCTGCAGGCCCATCCACCTGGCCCT
GCAAGGCCGGCTACGTGACCGACCGGCGCGCCGAGGTGAACATCGTGACCGACACCGCCTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACCAGTCCGAGCTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGGCCAACGAGCAGGTGGACAAGCTGGTGTCC
TCCGGCATCCGCAAGGTGCTGTTCCTGGACGGGCATCAGCTACGAGGAGGCCAAGAGCTGCCTCCGCCGCACTTCAAGGCCCTGCCGACAAGCTGGGCCCGAGACCGGC
CCTGCCCCCCCGTGGTGGTGGCACCCCACGTGGCCTCGGTGGCCGCAGGTGCAAGTGCCGCGTGCCGGCCGTGCACCGTCCCCGCCGCCGTGAAGGC
GGCCAGCTGGACTGCACCCCACCTTCATCCTGAAGCTGGCCGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCAGCGGGCTACACCTTCCACCTTCCGCCGCCATCT
CGGCCCAGGTGCGCCGAGTGCGACCACCGCCCGAGCTGCAGTGCCCCGTCCATGGCGTTCATCCACAAGACCGGCCTGGTGGAGTCCATGAACGAGGAGAGATCA
GCCGGGCGAGCCGCCATCATCGACACTACGCCGCCCCGACAACATCCAGACCAAGGAGCTGCAGAAGCAGAACTTCCGCGTGTACTACCGCGA
CTCCCGCGACCCCCATCTGGAAGGGCCCGGCCAAGCTGCTGTGGAAGGGCCCGGAGGCGGCGACGAGATCCAGGGGAGATCCCGAGATCCGGCGCCGCGA
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCGGCCGACGAGGAGGACTAA

Fig. 109B

2003_CON_A1 pol.OPT
TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCAGCAGACCGGCGGCCAACTCCCCACCTCCCGCGACCTGTGGGACGG
CGGCCGCGACTCCCTGCCCCTGCCCTTCCCGAGGCGGCCGGCCGAGCGCCAGGCGGCCACCTTCTCCTTCCCCAGATCACCCTGTGGCCAGCGCGCCCCTGTGTGA
CCGTCGGCGGCCAGCTGAAGGAGGGCCCTGCTGGACACCGTGGAGGACACCGTGCCCGGCCAAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGAAGCAGTAGCAGCCAGATCCTGCTGGAGGACATCGGCGGCAAGAAGGCCATCGGCAAGAAGGCCATCGAGAAGCTGCCCCATCTCCCATCCCCATCGAGACCGTGCCCGTGAAGCTGAAGC
CACCCCCGTGAACATCATCGGCCGCAACATGCTGACCCTGAACTTCCCCATCTCCCATCCTGAACTTCCCCATCCTGACCTGCACCCTGAACTT
CCGGCATGGACGGCCCCCAAGGTGAAGCAGTGGCCCCTGACCGGATCTGCACCGAGATCTGCACCGAGATGAAGGAGGGCAAGATC
TCCAAGATCGGCACCCGAGAACCCTACACAACACCCCATCTTCGCCCATCAAGAAGAAGGACTCCACCAAGTGGCGAGCTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCAAGTACACCGTCCTTCCGCGAGCTGGACGCGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGGACGAGTCCTTCCGCGCCATCTTCCAGTGCTCCTCCAAGATCCTGGAGCCCTTCCGCGCTCAAGAACGTG
CTGCCCCAGGGCTGGAAGGGCTCCCCCGCCCTTCCTGTGGATGGGCTACGTGGGCTCCGACCTGGAGATCGGCCAGCGCTCCAGCTGGGCTTCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTCCAGTGTTCGTGATGGGCCAAGCTGAACGGCCGCCATCAAGGTGAAGCAGCTGTGCAAGCTGCT
CCCCCCGACAAGAAGCACCACCAGAAGAAGGAGCTCCCCCTTCCTGTGGGCCAAGCTGAACGACATCAAGGTGACCCTGGCCTCCCCCAGATCTACGTGGGCCTGAACGCTGCACGGGCG
GAGTCCTTGGGACCGTGAAGCGACATCCAGAAGCTGGGCCAAGCTGAACGACATCAAGGTGACCCTGGCCTCCCCCAGATCTACGTGGGCTGAAGCTGCT
GCGCGGGCGGCCAAGCCCCTGACCGTGACCCTGAACATCGTGAACGACCTGATCGCCCACACCAACCGCGAGATCCTGACCGAGCTGGAGCTGGAGATCTGGGCG
TGTACTACGACCCCTCCAAGGACCTGATCGCCGCCAGAGATCCAGAAGAGCAGGCCCAGATCTACCAGAATCTACCAGATCTACCAGGAGGTGGTGACTGGCAGGTGGTGATCTGGGG
ACCGGCAAGTACGCCCGCAAGCGCTCCGGCCCACACCAACCAACGACGTGAACGTGAAGCCCCGAGAGCAGCGTGGTGGTGATGGAGTCCATCGTGATCTGGGG
CAAGAGACCCCCCAAGTTCAAGCTGCCCCATCCAGAAGGACCTGGGAGGAGATGGACTGGCCGCCACCTGGATGACCTGGATGGAGTTCGTGA
ACACCCCCCCTGGTGAAGCTGTGGTCAGCCGACCGCCGCCGCGCCCCAGAAGAAGTGGTGCCCTGACCGAGAAGTGGTTTCTACGTGGGCCGCCCAACCGCGAGACCAAG
CTGGGCAAGGCCGGCTACGTGACCGACCGTGACCCCGGCCGCCGCCCAGAGAAGTGGTGCCCTGACCGTGTCCCTGACCGAGCCGCTGCACGAGGACCACCACCGGC
CCTGCAGGACTCCGGCGTCCGAGGTGAACATCGTGACCGACTCCCCAGTACGGCGTGACGGCATCATCGTGACCGACTCCCCAGTACGGCCTCCGAGCTGGTGA
ACCAGATCATCGAGAAGCTGATCGGCAAGGACGAAGTGTTCCTGGCCTGGGTCCCCCCAGTACGGCGTGACCGACAAGGGCATCGGCCGCTACCACTGGGCCAACTGGCCCACTGGCCTCCGACTT
TCCTTCCGGCCATCGCCAAGGAGGTTCGTGTTCCTGGACCAAGGTGTCGTTCCTGGCCAAGGTGATCTCCGGCACACCACGTGGCCCAGGTGGACAAGCTGGTG
CAACCTGCCCCCCATCTGGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGCAGGTGTGATCCCCGCCGAGACC
TCTGGCAGCTGACCTGCCCACCCCATCTGGCAGCTGGACAAGCTGGTGCCCTGAAGCTGGTGGTCAAGGCCGTGGTGAGTCCATGAACAAGGAGCTGAAGAAGA
GGCCAGGCCTGCTGGTGGGCGAGAGTTCGGCATCCCCTACAACCCCCTACAACCCCGTGCCCGTGTTCATCCACAACTTCAAGCGGCATGCGCAAGGCGGCCATCGGCCTGTACTACCG
TCATCGGCCAGGTGCGCGAGCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGGCGCCAAGATCCAGAAGGTGCTGGTGCTGGTACTACCG
CGACTCCCGCCGCACCGAGCTCTGGAAGGGCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCGTGGTGATCGATCCAGGACGACAACTCCAGGACTAA
GCCGCCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCTGGGCCGCGGTGGGCCGCGACTGCGTGGGCCGCGACATCAAGGTGGTGCCCC

Fig. 109C

64. 2003 A1.anc pol.PEP
FFRENLAFQQGEARKFSSEQTRANSPTSRELWDGGRDSLLSEAGAERQGTVPSFSFPQITLWQRPLVTVKIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
ESFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRSKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELRAHLLSWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIKLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVTLTEEAELELAE
NREILKDPVHGVYYDPSKDLVAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKKRSAHTNDVKQLTEVVQKVATESIVIWGKTPKFRLPIQKET
WETWWMEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELHAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIEKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVV
HTDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNEKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 109D

2003_A1.anc pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGCCAACTCCCCCACCTCCCCGAGCTGTGGGACGG
CGGCCGCGGACTCCCTGCTGTCGCAGCGCCGGGAGCGCCGAGCGCCCAGGCCACCGTGGCCTCCTTCCCCGAGATCACCCTGGCTGA
CCGTGAAGATCGGCGGCCAGCTGAAGGAGGCCCTGCTGGACACACCGTGCTGGAGGACATCAACCTGCCCGGCAAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGATCCTGATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCCGTGGGCCCC
CACCCCGTGAACATCATCGGCCGCAACATGCTGACCTGCGAACTTCCCCATCGCCTGGTGCCCGTGCCCGTGAAGCTGAAGC
CCGGCATGGACGACGGCCCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCAAGAAGAAGAAGAGTCCGTGACCTGGTGGACGTGGACCGAGCTGGAA
CAAGCGCCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCGCCTTCACCATGCCCTTCAACAACGAGACCCCCGGCATCCGGCTACCAGTACAACGTG
CTGCCCCAGGGCTGGAAGGGCTCCCCGCCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCTTCCGCTCCAAGAACCCCACCTGCTGTCCTGGGCTTCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAACATCGGCCCAGGAGCTGGAACTGGCCTACATCGCCAGCCGTGCCGAGAAG
CCCCCAGGAGCTACGCCAAGGCCCCCCTTCCTGTGGGATGGGCTACGAGCTGCACCCGAGATCAGCCCGGCATCCAGGTGAAGCTGGTGCAAGCTGCT
GACTCCTGGACCGTGAACGACATCCAGATCGGCCCGAGATCGTGACCCTGGCCTCCGAGGAGGCGGCCCTTCAAGAAGTGAAGCAGCTGTGCAAGCTGCT
GCGCCGGCGCCAAGGCCCTGACCGAGCGCTCCGCCACCAAGAGCCGGCAAGATGCTGGGGACCTGGGGCGCCAGAGTCCCATCGTGATCTGGGG
TGTACTACGCCAAGGCCCTCCAGAAGGACCGCTGGTGTGCGCGCCCACACCAACGAGGAGACCTGGTGTCAGAAGTGGCCCCGAGTCCCATCGTGATCTGGGG
ACCGGCAAGTACGCCAAGAGCTGGCCTGCCCGCCATCCCAGAAGGAGCACCTGGGGCGCCGCCATCGCCCGCGAGGAGACCTGGATCCCCGAGTCCCATCGTGATCGTGGGG
CAAGAGACCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACGTGGAGGAGAGCGCCATCGCCCGCGAGGAGGCCCAACCGCCGAGACCAAG
ACACCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCGTGGGCGCCGAGAAGGTGTCCCTGACCGAGGTGGTGCCCCTGACGTGGACGTGGTG
CTGGGCAAGGCCGGCTACGTGACCGACCGTGAACATCGTGACCGACCTCCGGGCTGAACATGTGACCGACTCCGGCTGGGCCCATCGGCGCAGAAGAGCTGGTG
CCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCGGGCATCATCGTGTCCCTGACGACTCCGGGCTGGGGCCCCATCTGGGACTGGCTGGTGA
ACCAGATCATCGGCATCGCCCCCCCATCGCCTGGACTGCTGTTCCTGACGAGATCAGCGGCCAGGAGTGTGCCAGAAGCCCTGGCGCGAGCAGTGGGTG
TCCTCCGGCATCGAGACAGTGCTGTTCCTGACGAGATCGCGGCCATCGAGACCAGGAGATGCCCCAGAAGTGCCGCGGCCCAGGGTGGTGA
CAACCTGCCCCCCATCGTGGGCCAAGGAGATCGTGGCCCTGCAAGTGCCGGTGCCATCGCCGACCTGGAGAGCAGCGGCCATGGCCTTCCGACTT
TCTGGCAGCTGGGACTGCCTGCACCCCACTTCCTGCTGCGGCAAGGTGCGCCCCGTGGCCGTGAAGGTGGCCGACGTGATCCCGCGCCGAGACC
GGCCAGGAGAGACCGCGCCTACTTCGTGCTGTGGGGCCAACATCCAGCAGGAGTTCGGCACCAAGCTGCACACCGTGTGAAGGTGGTGCCCCTACAACCTCCGCGCCGTGAA
GGCCGCCGCTGCTGGTGGGCCAACATGGCCGAGCATCCCCGCGAGCATCATCGCCGACATCATCGCCGACAATGAACAAGGCGGCATCGGCGTGTACTACCG
TCATCGGCCCGGGGCGAGCAGCTGCGCGAGCATCATCGACAATCCTGGAAGGGCGCGGAGGGCCAAGAACTTCCGCGCCATCATCAGGGCGGCATCGGCGTGTACTACCG
CCGACTCCCGCCCCGCCGAGGCACTGGCGAGATGCCCGAGACTGCGTGGTGATCCAGAAGAGCAAGCGCCCAGGACAACTCCGACATCAAGGTGGTGCCCC
GCCGCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGCAGATAGTGGCCGGCCGAGATGGCCCGGAGGGCCGAGACTCGTGGCCGCCGCGAGGAGGACTAA

Fig. 110A

65. 2003_CON_A2 pol.PEP

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FFRENLAFQQREARKFSSEQNRANSPTSRELRNGGRDNLLSEAGAEEQGTVHSCNFPQITLWQRPLVTVKIEGQLREALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQIAIEICGKRAIGTVLVGPTPVNIIGRNMLVQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICKEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLH
EDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRSKNPEMVIYQYMDDLYVGSDLEIGQHRAKIEELRAHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIKLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTDIVTLTKEAELELEE
NREILKNPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKRKSTHTNDVKQLTEAVQKIAESIVIWGKTPKFRLPIQKET
WETWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIAGAETFYVDGAANRETKLGKAGYVTDRGRQKIVSLTETTNQKTELHAIYLALQDS
GLEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIEKERVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRA
MAHDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVI
HTDNGPNFTSATVKAACWWAGVQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 111A

66. 2003_CON_B pol.PEP

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FFREDLAFPQGKAREFSSEQTRANSPTRRELQVWGRDNNSLSEAGADRQGTVSFSFPQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEEM
NLPGRWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVIPLTEEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFKLPIQKET
WEAWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTDTTNQKTELQAIHLALQDS
GLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSAGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKTI
HTDNGSNFTSTTVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED$
```

Fig. 110B

2003_CON_A2 pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGCGGCGGAGGCCCGGAGGCCCAAGTTCTCCTCCGAGCAGAACCGCGCCAACTCCCCCACCTCCCGCGAGCTGCGCAACGG
CGGCCGCGACAACCTGCTGCTGTCCGAGGCCGGCCGCGCCGGAGGACGGCAGGCCGCCGTGCACTCCTGCAACTTCCCCAGATCACCCTGTGGCAGCGCCCCTGTGA
CCGTGAAGATCGGCGGCCAGCTGCGCGAGGCCCTGCTGGACACCGGACATCAACCTGCCCGGCAAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCGCCAGCCTGCAGCGCCAGACCGTGCCCGTGGTCGGGCCC
CACCCCCGTGAACATCATCGCCGCCAACATGCTGGTGCAGCTGCGCCCTGACCCTGAACTTCCCCATCTCCCCATCGAGACCGTGCCCGTGCCCGTGAAGCTGAAGC
CCGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTTCCGCACGAGGACTTCCGCCCCTGCCCTTCACCAGTACACCCCCGGCATCCCGCTACCAGTACAACGTG
ACTTCCTGCGTGCCCCTGACGAGATCGGCCTCCCCGGCCATCTTCACCATGACCACCGGCCCTCCAAGAACATCCTGGAGCCCTTCCGCCGCCACCTTCCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGCGCGCACCTGCCCTGGGGCTTCACCA
CCCCCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCAAGCTGCCCCGAGAAG
GACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCAGATCTACGCCGGCATCAAGGTGAAGCAGCTGTGCAAGCTGCT
GCGCGGCACCAAGGCCCTGACCGAGGTCATCCCGCTGACCAAGGAGGCCGAGCTGGAGCTGGCCGAGAACCCCGTGCACGGCG
TGTACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGAAGCAGGGCCAGGGCCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAGAACCTGAAG
ACCGGCAAGTACGCCAGGCAAGTCCACCCACACCAACGACGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCATGGAGTCCATCGTGATCTGGGGG
CAAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGTGGAGCGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGA
ACACCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCCTCTACGTGGACGGCGCCAACCGCGAGACCAAG
CTGGGCAAGGCCGGCTACGTGACCGACCGCGGCCGCCAGAAGATCGTGTCCCTGACCGACACCACCAACCAGAAGACCGAGCTGCACGCCATCTACCTGGC
CCTGCAGGACTCCGGCCTGGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGTGTCCTGGACGGCCCCCAGAAGGGCGTGCACGAGGCCAAGCTT
TCCTCCGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCGCAGGAGGAGCACGAGAAGTACCACAGCAACTGGCGCGCCATGGCCAGCGACTT
CAACCTGCCCCCCATCGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCTCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTCATCCTGGTGGCCGTGCACGTGGCCAGCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACC
GGCCAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACTTCACCTCCGCCACCGTGAA
GGCCGCCTGCTGGTGGGCGCGGCGACCAGCCGCGACCACCTGGAGAGTTCGGCGTGCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGA
TCATCGGCCAGGTGCGCGACCAGGCCGAGCACCTGAAGACAGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTAC
TCCGCCGGCGAGCGCATCGTCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGTGTACTACCG
CGACTCCCGCGACCCCATCTGGAAGGGCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAACTCCGACATCAAGGTGGTGCCCC
GCCGCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCAGCCGCCAAGGAGGACTAA

Fig. 111B

2003_CON_B_pol.OPT

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TTCTTCCGCGAGGAGGAGCCTGGCCTTCCCCCAGGGCAAGGCCCGGCGAGTTCTCCTCCGAGCAGACACCGGCCCAACTCCCCACCCGGCGGAGCTGCAGGTGTG
GGGCGGCCGCGACAACAACTCCCTGCTCCGAGGGCGGCGGCCGCGGCGACCTGGGACACCGTGCTGGAGGAGATGAACCTGCCCGGGCCGCTGGAAGCCCAAG
CCATCAAGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGGAGATCGTGGGCCACAAGGCCATCGAGACCGTGCCCGTGGAAGCTGAAGC
ATGATCGGCGGCATCAAGATCATCGGCCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGGTGGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
CGGCATGGAGGACGGCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGGTGGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCAGAACCCCTACAACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGGGCGACGCCT
CAAGGGCCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCGGAGCTGGCAGAAGGAGTCCGCCAAGCAACGTG
ACTTCTCCGTGCCCCTGGACAAGGGCTCCCCGCCAATCTTCCAGTACACCAGCCCTTCCATGACCAAGATCCTGGAGGCCATCCGTGCTGCCGGAGAAG
CTGCCCCCAGGCTGGAAGGGCTGGGATCCGGCTCCGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGGCTACCGCCAGCACCGTGGGGCTTCCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGGCTACCGCGAGCACCGTGGGGCTTCCACCA
CCCCCGACAAGAAGCACCAGAAGAAGCACCAGAGCCCCTTCGTGTGGATGGGCAAGCTGACCTGGCAGCTGTGCAAGCTGTGCAAGCTGCT
GACTCCCTGACCGTGAAGCAGATCAGAAGACGTGGCACCTGGGCGCCCACACCGAGAAGACGACCTGGGAGGGCCTGAAGCAGCGTGCACGCGCG
GCGCGGCCAAGGGCCCTGACCGGAGGTGATCCCCCTGACCGAGCTGCGCCGAGATCCAAGGACCTGATCGGCCCCACCAGAAGGCCCTTCAAGAACCTGAAGC
TGTACTACGACCCCTTCCAAGGACCTGATCGCCGGCGCCCACACCAGAAGGAGACGTGGGGAGGCCTGGGAGGCAGTGTGCCAGTCCCCCGAGATCCGTGGGG
ACCGGCAAGTACGCCCGGATGCGGGGCGCCCACACCAACGTGGGCCATCTGGGCGCCATCCGTGGGCTGGTGACCTGATCGTGGTACCGCCAGCCAGTGGGCCTGGGAGTTCGTGA
CAAGAGAACCCCCAAGTTCAAGCTGCCCATCCAGAAGGAGACGTGGGAGAAGGAGCTGGAGAAGAGGAGCCCCATCGTGTGGTACCGAGGGCGCCAACCGGAGACCAAG
ACACCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCCAGAAGGTGGTGTCCCTGACCGACCTTCTACGTGACCGGCGCCCAACCGGAGACCAAG
CTGGGCAAGGCCGGCTACGTGACCGACCGGGCCGGTGGTGACCGACCTTCTACGTGACCGGCGCCCAACCGGAGCTGCAGGCCATCCACCTGGC
CCTGCAGGACTCCGGCCTGGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACACCAGAAGGGCCATCGGCCAGCAGTGGTG
TCCGCCCGACATCATCGCCCCGTGGTGGCCAAGGAAGTGTACCTGGCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAATGAGGAGAGCCGAGTCTGGTG
CAACCTGCCCCCGTGGTGCTGTTCCTGGACGGCATCGTGCCCCTTCCTGCTGCCGCCCACCGACCCGTGCGCGCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTTCCTGCTGCTGAAGGGCATCATCGGCCCCGTGGAAGCTGCCCGTGGAAGCTGTGGTCATCTGCGCCGTGGAAGGCTAC
GGCCAGGAGGACGGCCGCTACTTCCTGCTGAAGGGCCGGGGGGCGCCGGCGTGAAGGAGCTGGAGGGCGCCGAGGTCATCTTCACCTGCGCCGTGGAAGGCTAC
GGCGGCCTGTGTGGGGACCGACCGGGCGCCAGCCACTGGCCATGAGGGCCCGGCTGGTTCATCGAAGGCGGCAATCCAGATCCAGGACACAACTCCGACATCTACCG
TCATCGGCCAGTGGACTGCACCCCCCGTGCGCGCGACCAGCCACTGGCCATGAGGGCCCGGCGCCCATCGAAGCGCCAAGGGCGGCATCGGCGTGTACTACCG
CGACTCCCGGAGCCGCCGCCACCCCCGTGGAAGGGCGCGGCGCGCCCGGCTGCTGTGGAAGGCCGGAAGGGCGCGCCGCGCAGCATCAAGGTGGTGCCCC
GCCGCCAAGGGCCAAGATCATCCGCGCGACTACGGCAAGCAGAGCAGATGGCCCGGCGACTGCGTGGCCCTCCCCGCCAGGACGAGGACTAA
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Fig. 111C

67. 2003_B.anc_pol.PEP

FFRENLAFPQGKAREFSSEQTRANSPTRRELQWGRDNNPLSEAGADRQGTVSFSFPQITLMQRPLVTIKIGGQLKEALLDTGADDTVLEEM
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDERELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVVPLTEEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFKLPIQKET
WEAWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTDTTNQKTELQAIHLALQDS
GLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSAGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVI
HTDNGSNFTSTTVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED$

Fig. 111D

2003_B.anc pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCCCCAGGGCAAGGCCGGCGACCGGCCGCCAACTCCCCACCCCGCGCGAGCTGCAGCTGTG
GGGCCGGCGACAACAACCCCCTGTCCGAGGCCACCGGGCCGGCCGCCGAGGGCGACCCGCCGAGATCACCCGTGGCAGCGCCCCTGGTGA
CCATCAAGATCGGGCGGCCAGCTGAAGGAGGCCCTGCTGGACACCGTGCTCGGCGACGACACCCGTGCTGCCCGGCAAGTGGAAGCCCAAG
ATGATCGGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGATCCTGATCGAGATCGGCCCAGATCCTGACCCTGAACTTCCCCATCTCCCCATCGCC
CACCCCGTGAACATCATCGGCGCAACCTGCTGACCCTGAGATCGGCTGCTGACCCTGGTGCCCCTGACCGAGAAGATCAAGGCCCTGGTGGAGATGGGCCC
CCGGCATGTGGACGCGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAAGATCAAGGCCCTGGTGACTCCACCAAGTGGCGAAGATGGAGAAGAGGCAAGATC
TCCAAGATCGGCCCCGAGAAACCCTACAACACCACCCCGTGTTCGCCATCAAGAGAAGAACTCCACCAAGTGGCGAAGCTGGTGGACTTCCGCGACGTGGGCGACCGT
CAAGGCGCACCCAGGAGATCTCTGGGAGGTGCAGCTGGCATCCCCGCGGCCGCCTTCACGAGAGATCCCCTGAAGAAGAAGAACTCACCAAGAGCTCCGTGACGTGGGCGACGCCT
ACTTCTCCGTGCCCCCTGGAAGGGCTGGACAAGGACTTCCGCGAAGTCACCTTCCGGCCATCTTCAGTGCCTCGAGATCCTGGAGATCGGCCAAGATCCTGGAGCCCCATCCGCTACCAGTACAACGTG
CTGCCCCAGGGCTGGAAGGGCTCCCCGACCTTCCGGCTCCGACCATCTTCAGTGCCTCCTGATGGGCTACGAGCTGCACCCGGACCTGCAGCCGCATCGAACGACCCCGAGATCGTGATCTACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGTACGTGGGCTACGAGCTGCTGCCCGACTGGGCCTGAACCTGGGGCCCTGAACCTGGGGCCCTGAAGCTGGTGCCCCTGACCAGTGCTGCCCGAGAAG
CCCCCGACAAGAAGCACCAGAGAGAGCCCCTTCCTGTGGATGGCTGGTGGCCCCTGACCGAGGCCCCGGGCGCCCCTGAAGTGGGCTACGAGCTGCACCCGGACCTGCAGCCGCAAGCTGCT
GACTCCCGACAAGTTCAAGTGCCTGCCCATCAGAAGGAGACATCCAGAGGACCTGGAGGCCGGCCATCGGTGCCCCTGACCGAGGTACTGGGACACCGGCCAGTCCCGAGGAGTTCGTGA
GCGGCGGCCAAGGCCCTGAACGACACTCCTGACCGAGGCCTGAACGACGTGGAAGCTGGGTGTCCCTGACCGGCCATCATCCGCCCCCACAAGTGGCAGGCCATCCAGCAGGACCAAG
TGTACTACGACCCCCTGCCAAGACCGTGAACGAGCTGATCGCCGCGGCCCACCCGCGGCCATCATCCGCCCCCACAGGAGCAGCTGCTTCCACGTGGACCTGATCGTGGGG
ACCGGCAAGTACGCCCGATGCGCGGCCCCACACCAAGGAGAGCTGGAGGCCGTGAAGCAGTCAGCCATCCCTGATCGTGGGGCCCCACCAAGTGGCACCCGTGATCTGGGG
CAAGACCCCCCCCCGGTGAAGTTCAAGTGCCTGCCCATCAGAAGGAGACATCCAGAGGACCTGGAGGCCGGCCATCATCCGCCAGAAGACCAGAGAACCGCGAGACCAAG
ACACCCCCCCCTGGTGAAGTGTGTGACCGCTACGTGCTCTACGTGGACGGGGCGCCCGAGAAGGTGGTCCCCTGACCGTGGCGCCCCATCCCTGGGGGGCCCCGGGGCGCCCCCCGGGGGGCCGGGGGCCTTCTGTGGG
CTGGGCAAGGCCGGCTACGTGGCCCTGAAGCTGTGTGACCGACGGCGGCCCCGGGCGCCGCCGCCGCCTGGGGGGCCGGGGGCGCCGCCATCCACCCTGGC
CCTGCAGGACTCCGGCGGCTGGAAGGGTGCTGCTGCCCCAAGGCATCGCGCGGCCAGCCGCAGGCAGGTGGACAAGGCCCATCGCGCGGCGCATCGTGTGGCCCGAGTCCGAGCTGGTGT
CCCAGATCATCGAGACGCGGCGCCCCGGTGATCAAGGAGAAGAGCGCCCCAGAGGAGCACGAGAGCAGGTGGACAAGGCCCATCGGCGGCCATCCGGGGCTGGGGGGCCGGGGGGCGCCCATCCGAGGTGTACTACTTCGTGCAGATCTGGGGCCCCGGGCCCGGGCCTTCAGAACCTGAAGC
TCCGCCGGCATCGGGCCCGGTGGTGGCCGCCTGGGCGCCAAAGATCGTCTGCCTGGGGGGGCCCCGCCCGGGGGCCGGGGGCGCCGCCAGCGCCCATCCGAGGTGTACTACTTCGTGCAGATCTGGGGCCCCGGGCCCGGGCCTTCAGAACCTGAAGC
CAACCTGCCCCCCCGTGGGTGGGCGCCCCCATCCGTGGCCTGTGGGCGCCTGGAAGGTGCCGCAAGTGCGCCCGGCCAGTGGACTGGCCTCCCCGGGCAGTGGACTGGCCTCCCCGGGCCCGGGCCCTGGGGGCCAAGTTCGCCCGTGTTCATCCACGCGGTCGTGTTCATCCACGCGTTC
TCTGGCAGGCTGATCGCCCCCTGGGACTGCGCTGGTGCCGGCTGGAAGGGCAAGATCATCCACGCGGTCGTGTTCATCCACGCGCGGCCCTGCTCCCCGGCCGGCCAGGCCTCCGGCGGCTGGGGGCGCCATCATCGACCTGATCAACCCCAGTCCCGGCGCCTGGGGGGCCGGGGGCGCCATCATCGGCCTGATCAACCCCAGTCCCGGCGCC
GGCCGGCCTGGTGGTGGCACCCCATCCGCGGCCCATCGGCCAGCGGCAGGCCACCTGCCACACCGGGCGCCGTGGAGGTGATCCCCAGTCCCGTGTTCATCCACGCGGCGCCGCCGCCATCGCGCGGCATCATCGGCCTGATCAACCCCAGTCCCGGCGCC
GGCCGGCCTGGTGGTGGCACCCCATCCGCGGCCCATCGGCCAGCGGCAGGCCACCTGCCACACCGGGCGCCGTGGAGGTGATCGCCCAGTTCCTGAAGGTGCCCGTGTGCAGATCCCCATCCCCATCCCCATCCCCATCCGCGGCCGCCGCCGCCATCGCGCGGCATCATCGGCCTGATCAACCCCAGTCCCGGCGCC
GGCCGGCCTGGTGGTGGCACCCCATCCGCGGCCCATCGGCCAGCGGCAGGCCACCTGCCACACCGGGCGCCGTGGAGGTGATCGCCCAGTTCCTGAAGGTGCCCGTGTGCAGATCCCCATCCCCATCCCCATCCGCGGCCGCCGCCGCCATCGCGCGGCATCATCGGCCTGATCAACCCCAGTCCCGGCGCC
GCCCGGCAAGGCCCAAGATCATCCGCGGCGACTACGCGGCAAGCAGCAGATGCGGCCGCCGCGCGACTGCTGGCCCGCCAAGTCCGAGCTGGTGT
GCCCGGCAAGGCCCAAGATCATCCGCGGCGACTACGCGGCAAGCAGCAGATGCGGCCGCCGCGCGACTGCTGGGCCCGCCAAGTGGTGGTGCCCCC
```

Fig. 112A

68. 2003_CON_C_pol.PEP

FFRENLAFPQGEAREFPSEQTRANSPTSRELQVRGDNPRSEAGAERQGTLNFPQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEINLPG
KWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKA
LTAICEEMEKEGKITKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDEGFR
KYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAQNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGFTTP
DKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAENREI
LKEPVHGVYYDPSKDLIAEIQKQGHDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVIWGKTPKFRLPIQKETWETW
WTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKIGKAGYVTDRGRQKIVSLTETTNQKTELQAIQLALQDSGSEV
NIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKERVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMASE
FNLPPIVAKEIVASCDKCQLKGEAIHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYYILKLAGRWPVKVIHTDN
GSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQ
TKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIKDYGKQMAGADCVAGRQDED$

SUBSTITUTE SHEET (RULE 26)

Fig. 112B

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2003_CON_C pol.OPT
TTCTTCCGCGAGAACCTGGCCTTCCCCCAGGGCGAGGCCCGCGAGTTCCCTCCGAGCAGCAGACCCGGCCAACTCCCCACCTCCGGAGCTGCAGGTGCG
CGGCCGCACACCCCCGCTCCGGAGGCCGGCGGCCGGAGGCGGCCAGGGCACCCTGAACTTCCCCAGGAGCAGCCCCCCTGGTGTCCATCAAGGTGG
GCGGCCAGGATCAAGGAGGCCCTGCTGGACACCGTGCTGGAGGAGATCAACCTGCCCCGGCAAGTGAAGCCCCAAGATGATCGGCGGC
ATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCCCACCCCCGTGAA
CATCATCGGCCGCAACATGCTGACCCAGCTGGGCTGCACCCTGAACTTCCCCATCAGCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCCCGGCATGGACG
GCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGCCATCTGCGAGGAGATGGAGAAGGAGGGCAAGATCACCAAGATCGGC
CCCGAGAACCCCTACAACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAAGCGCACCCA
GGACTTCTGGGAGGTGCAGCTTCCGCAAGTACACCGCCTTCACCATCCCCTCCATCAACAACGAGACACCCCGGCATCGCCAGTACAACGTGCTGCCCCAGGGC
CCCTGGACGAGGGCTTCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCGCCCAGAACCCCGAGATCGTGATCTACCAGTACATGGACGA
TGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGAGCTGCGCCCTGCTGAAGTGGGCGGCTTCACCACCCCCGACAAGA
CCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCGCCAAGATCGAGGAGCTGCGCCAGCACCTGCTGAAGTGGGGCTTCACCACCCCCGACAAGA
AGCACCAGAAGGAGCCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCGTGCTGCCCGAGAAGGACTCCTGGACC
GTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGCGCCAGCTGTGCAAGCTGCTGCGCGGCACCAAG
GCCCTGACCGAGGTCGTGCCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGTGCACGGCGTGTACTACGACC
CCTCCAAGGACCTGATCGCCGAGATCCAGAAGCAGGGCCAGGGCCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAGAACCTGAAGACCGGCAAGTAC
GCCAAGATGCGCAGCGCACCCACCAACGACGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCATGGAGTCCATCGTGATCTGGGGCAAGACCCCCAA
GTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGAACACCCCCCCCC
TGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCGTGGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAACAGAGACCCCGAGTCCGAGCTGGTGAACCAGATCATCG
GGCTACGTGGACGGCGCCGCCAACAGAGAGACCAAGCTGGGCAAGGCCGGCTACGTGACCGACAGAGGCCGCCAGAAGGTGGTGTCCCTGACCGACACCACCAACCAGAAGACCGAGCTGCAGGCCATCTACCTGGCCCTGCAGGACTCCGGCCTGGAAGTGAACATCGTGACCGACAGCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACCAGTCCGAGTCCGAGCTGGTGAACCAGATCATCG
AGCAGCTGATCAAGAAGGAGAAGGTGTACCTGGCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTGTCCTCCGGCATC
CGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAAGAGCACGAGAAGTACCACTCCAACTGGCGCGCCATGGCCTCCGACTTCAACCTGCCCCCC
GTGGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCGGCATCTGGCAGCTGG
ACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACCGGCCAGGAGACC
GCCTACTACATCCTGAAGCTGGCCGGCCGGTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACTTCACCTCCGCCGCCGTGAAGGCCGCCTGCTG
GTGGGCCGGCATCCAGCAGGAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCATCGGCCAGG
TGCGCGACCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTACTCCGCCGGCGAG
CGCATCGTCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGTGTACTACCGCGACTCCCGCGA
CCCCATCTGGAAGGGCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAACTCCGACATCAAGGTGGTGCCCCGCCGCAAGGCCA
AGATCATCAAGGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCTCCAGGCAGGACGAGGACTAA
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Fig. 112C

69. 2003_C.anc pol.PEP

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FFRENLAFPQGEAREFPSEQTRANSPTSRELQVGRDNPRSEAGAERQGTLTLNFPQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEINL
PGKWKPKMIGGIGGFIKVRQYDQILLEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKI
KALTAICEEMEKEGKITKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDEG
FRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAQNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGFT
TPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAENR
EILKEPVHGVYYDPSKDLIAEIQKQGHDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVIWGKTPKFRLPIQKETWE
TWWTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKIGKAGYVTDRGRQKIVSLTETTNQKTELQAIQLALQDSGS
EVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMA
SEEFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIHT
DNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATD
IQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGADCVAGRQDED$
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Fig. 112D

2003_C.anc pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCCCCAGGGCGAGGCCCGCGAGCCCGAGTTCCCTCCGAGCAGACCCGGCCAACTCCCCCACCTCCCGCGAGCTGCAGGTGGG
CCGCGACAACCCCGCTCCGAGGCGGCGCCGAGCCCGAGGGGCGCCAGGGCGCCCTGCTGACACCGGCCGCGACGACACCGTTCCCCAGATCACCCTGGCAGCGCCCCTGGTCGTCCATCA
AGGTGGGGCGCCAGATCAAGGAGGCGCCCTGCTGACACCGGCCGCGACGACCAGATCCTGCTGGAGGAGATCAACCTGCCCCGGCAAGTGGAAGCCCAAGATGATC
GGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGATCGAGATCTGGGCAAGAAGGCCATCGAGACCGTGCCCGTGGTGGGCCCCCACCCCC
CGTGAACATCATCGGCCGCAACATGCTGACCCAGCTGACCCAGCTGGGCTGACCCTGAACTTCCCCATCCCCGAACTTCCCCATCTCCCCATCTCCCCTGAACTTCGACCCTGAAGCCTGAAGCTGAAGCTGAAGCCCGGCA
TGGACGGCCCCCAAGGTGAAGCAGTGGCCCCTGACCAGGAGAAGATCAAGGCCCTGACCGCCGCCATCTGCCAGGCGAGGAGAAGGAGGCAAGATCACCAAG
ATCGGCCCCGAGAACCCCTACACACACCCCGTGTTCGCCATCAAGAAGAAGAAGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAAGCG
CACCCAGGACTTCTGGGAGGTGCAGCTGGCATCCCCACCCCGCGCCTGAAGCAGAAGAAGTCCGTGGCCGTGGGGCGACGCCTACTTCT
CCGTGCCCCCTGGACGAGGGCTTCCGCAAGTACACCCCGCCTTCACCATCCCCTGACCAAGATCCTGAGCCACCTGCTGAGTGGGGGCTTCACCACCCCG
CAGGGCTGGAAGGGCTCCCCGCCATCTTCCAGTCCTGCATGACCAGCCAGAATCCTGAGCGCTGCCCGAGGAAGGAGCTCC
GGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCTGGGCTCCGACCTGGGCTACGAGGTGCACCCCGACCAAGCTGCCCGAGAAGGACTCC
ACAAGAAGCACCAGAAGGAGCGCCCCCTTCCTGTGGATGGGCTACAAGTGGCCTCCAGATCTACCCGCATCAAGGTGCCCAAGCTGTGCGCGG
TGGACCGTGAACGACATCCAGAAGCTGTGTGCCCCTGACCGAGGAGGCCGAGCTGGACACCAGCAGTGACCGCCGTGTACT
CGCCCAAGGCCCTGACCAAGCTCGTGCCCGACACATCGTGCGCCGAGATCCAGAGGCTGGCCACGACGCTGAAGAACCTGAAGAGACCGGC
ACGACCCCTCCAAGACCTGATCGCCGAGATCAACACCACCAAACGACGTGAAGCAGCAGCAGTGACCGAGGCCGTGCCATGGAAGATCTACCAGGCCTTCATCGACGGCAAGAC
AAGTACGCCAAGATGCGCCACCGCCCCACCAACACGACGTGAAGCAGCTGCTGGGACCGTGAACTACCGGC
CCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCCTGGGGACGCCCATCTGCCGAGAGAGCTGGGAGTTCGTGAACACCC
CCCCCCTGGTGAAGCTGTGGTACCAGCCGCGCGCCGAGAAGAGCCCATCTGCGCCGAGAGAGACCGAGACCAAGATCGGC
AAGGCCGGCTACGTGACCGAGGTGACCGACCGCGCGCCCCGAGAAGATCGTGTCCCTGACCGAGACCCAGAGACCAGCTGCCCTGCA
GGACTCCGGCCTCCGAGGTGAACATCGTGACCGCTCCCAGTACGCCCGCCGGCCCTGGGTGCCCGAGCTGGTGAACCAGA
TCATCGAGCAGCTGATCAAGAAGGAGGAAGTGTACCGTCCTGGCGGCATCGACATGCCTGAGCCCAGGTGACAAGCTGGTGTCCTCC
GGCATCCGCAAGGTGCGTGTTCCTGGACGCGGCATCGCCAAGGCCCAAGGCGCCGCAGGTGACCATGGCCCAGCTGCCGCCAGCCATCTGGC
GCCCCCCCATCCTGGCCACCCACCGTGCGGCCAAGATCATCTGGCCGCCCGCAAGGGCCCCATCGAGGGCCGCCGGCCCAG
AGCTGGACTGCACCCCGAGCTTCATCCTGAAGGTGGCCGTGCCCCGCTGCCCGTGAAGGTGATCCCCGCCCCGACACCGGCCGGCCAG
CTGCTGCTGGTGGGCGCATCCAGCCCCAGGAGTTCGGCCGAGTCCCAGGCCGTGGTGAGTCCATGAACAACCCCCAGGGCGTGGTGAAGAGCTGAAGAGATCATCG
GCCAGGTGCGCGACCAGGCCGAGCACCTGACCCAGCTGTGTTCATCCACAACTTCAAGCCGCGCTACTCCGCC
GGCGAGGCGCATCATCGACACATCGCCGCCACCACCAAGGAGTTCGAGATCGTGTGTGGAACATCCGAGACATCAAGAGGACTC
CCGCGACACCCCATCCTGTGGAAGGGCCCGCCCAAGCTGCTGTGATCCGAGCAGCAACTCCGACACATCAAGGTGGTGCCCCGCCGCA
AGGCCCAAGATCATCCCGACTACGGCAAGCAGCAGATGGCCGCGGCCGACTGCGGTCGGCCCGACTGCTGGTGGGCCCGAGGAGGACTAA
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SUBSTITUTE SHEET (RULE 26)

Fig. 113A

70. 2003_CON_D_pol.PEP

EFRENLAFPQGKAGELSSEQTRANSPTSRELRVWGGDNPLSETGAERQGTVSFNFPQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILLEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISRIGPENPYNTPIFAIKKKDSTKWRKLVDFERELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DERKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFKQNPEIVIYQYMDDLYVGSDLEIGQHRTKIELREHLLRWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIKLPEKESWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGTKALTEVIPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIAIESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIIGAETFYVDGAANRETKLGKAGYVTDRGRQKVVPLTDTTNQKTELQAINLALQDSG
LEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHEKYHNNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLKLAGRWPVKVVH
TDNGSNFTSAAVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAT
DIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKVKIIRDYGKQMAGDDCVASRQDED$

Fig. 114A

71. 2003_CON_F1_pol.PEP

EFRENLAFQQGEARKFPSEQTRANSPASRELRVQRGDNPLSEAGAERRGTVPSLSFPQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVKQYDHILIEICGHKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFERELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPERTKNPDIVIYQYMDDLYVGSDLEIGQHRTKIELREHLLKWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIALESIVIWGKTPKFKRLPILKET
WDTWWTDYWQATWIPEWEFVNTPPLVKLWYQLETEPIVGAETFYVDGASNRETKKGKAGYVTDRGRQKVVSLETTNQKAELQAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIQKEKVYLSWVPAHKGIGGNEQVDKLVSAGIRKILFLDGIDKAQEEHEKYHNNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKII
HTDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNEKRKGGIGGYSAGERIIDIIA
TDIQTRELQKQITKIQNFRVYYRDSRDPVWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 113B

2003_CON_D pol:OPT

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TTCTTCCGCGAGAACCTGGCCTTCCCCCAGGGCAAGGCCGGCGAGCTGTCCTCCGAGCAGACCCGCGCCAACTCCCCCACCTCCCGCGAGCTGCGCGTGTG
GGGCGGCGACAACCCCCTGTCCGAGACCGGCGCCGAGCGCCAGGGCACCGTGTCCTTCAACTTCCCCCAGATCACCCTGTGGCAGCGCCCCCTGGTGACCA
TCAAGATCGGCGGCCAGCTGAAGGAGGCCCTGCTGGACACCGGCGCCGACGACACCGTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGATCGAGATCTGCGGCCACAAGGCCATCGGCACCGTGCTGGTGGGCCCCAC
CCCCGTGAACATCATCGGCCGCAACCTGCTGACCCAGATCGGCTGCACCCTGAACTTCCCCATCTCCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCCCG
GCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
CGCATCGGCCCCGAGAACCCCTACAACACCCCCATCTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCCGCCGGCCTGAAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGCCTACT
TCTCCGTGCCCCTGGACGAGGACTTCCGCAAGTACACCGCCTTCACCATCCCCTCCATCAACAACGAGACCCCCGGCATCCGCTACCAGTACAACGTGCTG
CCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAGAACCCCGAGATCGTGATCTACCAGTA
CATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGCGAGCACCTGCTGCGCTGGGGCTTCACCACCC
CCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCAAGCTGCCCGAGAAGGAG
TCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGCGCCAGCTGTGCAAGCTGCTGCG
CGGCACCAAGGCCCTGACCGAGGTGATCCCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGTGCACGGCGTGT
ACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGAAGCAGGGCCAGGGCCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAGAACCTGAAGACC
GGCAAGTACGCCCGCATGCGCGGCGCCCACACCAACGACGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCATCGAGTCCATCGTGATCTGGGGCAA
GACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGAACA
CCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCATCGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAACCGCGAGACCAAGCTG
GGCAAGGCCGGCTACGTGACCGACCGCGGCCGCCAGAAGGTGGTGCCCCTGACCGACACCACCAACCAGAAGACCGAGCTGCAGGCCATCAACCTGGCCCT
GCAGGACTCCGGCCTGGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACAAGTCCGAGTCCGAGCTGGTGTCCC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGGCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTGTCC
AACGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACAACAACTGGCGCGCCATGGCCTCCGACTTCAA
CCTGCCCCCCGTGGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCATCT
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACCGGC
CAGGAGACCGCCTACTTCCTGCTGAAGCTGGCCGGCCGCTGGCCCGTGAAGGTGGTGCACACCGACAACGGCTCCAACTTCACCTCCGCCGCCGTGAAGGC
CGCCTGCTGGTGGGCCGGCATCAAGCAGGAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGCCAGGTGCGCGACCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTACTCC
GCCGGCGAGCGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGTGTACTACCGCGA
CTCCCGCGACCCCATCTGGAAGGGCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAACTCCGACATCAAGGTGGTGCCCCGCC
GCAAGGTGAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCTCCCGCCAGGACGAGGACTAA
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Fig. 114B

2003_CON_F1 pol.OPT

Fig. 115A

72. 2003_CON_F2_pol.PEP

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FFRENLAFQQGEARKFSSEQTRANSPASRELRVRRGDNSLPEAGAERQGTGSSLDFPQITLWQRPLVTIKVGGQLREALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQIPIEICGQKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KEFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAKNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQAIQLPDKSSWTVNDIQKLVGKLNWASQIYPGIRVKHLCKLLRGAKALTDVVPLTAEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGHDQWTYQIYQEPHKNLKTGKYARRKSAHTNDVKQLTEVVQKIATEGIVIWGKVPKFRLPIQKET
WEIWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVPLTETTNQKTELQAIHLALQDS
GSEVNIVTDSQYALGIIQAHPDKSESELVNQIIEQLIQKERVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDENLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKII
HTDNGSNFTSTVVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQITKIQNFRVYFRDSRDPVWKGPAKLLWKGEGAVVIQDNNEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 116A

73. 2003_CON_G_pol.PEP

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FFRENLAFQQGEAREFSSEQARANSPTRRELRVRRGDSPLPEAGAEGKGAISLSFPQITLWQRPLVTVKIGGQLIEALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEISGKKAIGTVLVGPTPINIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
NFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKESWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAEN
REILKEPVHGVYYDPSKELIAEVQKQGLDQWTYQIYQEPYKNLKTGKYAKRGSAHTNDVKQLTEVVQKIATESIVIWGKTPKFKLPIRKETW
EVWWTEYWQATWIPEWEFVNTPPLVKLWYRLETEPIPGAETYYVDGAANRETKLGKAGYVTDKGKQKIITLTETTNQKAELQAIHLALQDSG
SEVNIVTDSQYALGIIQAQPDRSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWANITQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNNEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 115B

2003_CON_F2_pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCAGCAGGGCGAGGCCCGCCAAGTTCTCCTCGAGCAGACCCGCGCCAACTCCCCGCCTCCCGCGAGCTGCGCGTGCG
CCGCGGCGACAACTCCCTGCCCTGCCCGCGGCCCGGCCCGCGAGCGCGGCCCGCGGCCTCCTCCCGACTTCCCCAGATCACCCTGTGGCAGCGCCCCGGTGA
CCATCAAGGTGGGCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGAGATCCCCACCCTGCTGGACGACCGTCCCCGCCAAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGAGATCCCCACCCTGAACTTCGCGGCCAGAAGGCCATCGGCGACCGTGCCCGTGGGCCCC
CACCCCCGTGAACATCATCGGCCGCAACATGCTGACCCCGTGAAGGTGAAGCAGTGCCCCTGACCGAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGCAAGATC
CGGGCCATGGACGGCCCCAAGGTGAAGCAGTCAGTGCCCCTGACCGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCACCCAGGACTTCTGGGAGGTGCAGTCCGCAAGAAGGAGTTCCGCAAGGAGGTCCCTCAÇCATCCCCTCAÇCATCCCCGGCATCGGACGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGGACAAGGAGTTCCGCAAGAAGGAGTCCCGGCATCCCTCAÇCATCAACAACGAGACCCCCGGCATCCGCAGTACAACGTG
CTGCCCCCAGGGCTGGAAGGGCTCCCCCGGCCATCTTCAGTCCTCCATGACCAAGATCCTGGAGCCTTCCGCGGCCAAGAACCCCGAGATCGTGATCTACCA
GTACATGATGACGACCTGTACGTGGGCTTCCGACCTGCGCCAGAGCTGCGCCAGCAACAGATCGAGGAGCTGCGGCCATCCAGCTGCCCGACAAGG
CCCCCGACAAGAGCACCAGAAGAGCCCCCTTCCTGTGGATGGGCTÁCGAGCTGCAGGCCATCAGTGACCGTGCACCCCCGACATCGGCCATCCAGCTGCCCGACAAGG
TCCTCCTGGACCTGAACGACATCCAGAAGCTGGTGGGCCCCTGAACCTGGGCCTCCCCGAGAGCTGCACCGTGAACTGGGCCTCCCCGAGAGCGCCTCAACTGCCCGACAAGCTGCT
GCGGGGCCAAGGCCCTGACCGAGCGTGGTGCCCCTGACCGAGATCCAGAAGCTGGTGGGCCCCTGAACCTGGGCCGAGAGCCCCACAAGAACCTGAAG
TGTACTACGACCCCCTCCAAGACACCGCCGCCAGTCGCCGCCCATCCAGAAGGACGACCTACCCGCGAGCTGCACCAGATCTACCCCGAGAACCTACCCCGAGATCTACCCCGAGAACTGTGGGG
ACCGGCAAGTGCCCAAGTTCCGCCTGCCCGCCCATCCAGAAGGACGTGGGCGACGTGAAGCAGTCGAGGCAGCAGTGGTGCAGGCATCGTGATCGTGGGG
CAAGGTGCCCAAGTTCCGCCTGCCCGCCCCATCCAGAAGGAGACCTGGGTGGTGGTCTCGTGGAGATCTGGTGGAGAGCTTCGAGTGGGAGTTCGTGA
ACACCCCCCTGGTGAAGCTGTGGTGGTACCAGCTGGAGAGCTTCTÇTACGTGAGCTTTCTÇTACGTGGGCGCCGAGCCATCGTGGGCGCCAACCGCGAGACCAAG
CTGGGCAAGGCCGTACGTGACCGGCCGCGGCCGAGAAGGTGGTGCCCCTGACCGCCGAGAAGGTGGTGCCCCTGACCGACCAGAGACCGAGCTGCAGGCCATCCACCTGGC
CCTGCAGGACTCCGGCCTCCGGAGGTGAACATCGTGACCGGCGTGTÇCTGGACAGGCCGTGTÇCTGGACACGCCCCCGAGCTGCCCTGGGTGCCCCGACCGTGTÇCTGGAGAGCGCCAGTGCCCGAGCTGGTGA
ACCAGATCATCGAGACGAGCAGCTGATCAGAAGAGGAGCCGTGTÇCTGGTGCCCCTGACCCCGAGAGCCATCGGCGGCCAACGAGGAGCCATCGGCGGCCAACGCGAGCAGAAGTGGTG
TCCACCGGCATCGGCCCAAGGTGCGTTÇCTGGACGGCCATCGACAAGGGCCTGACGGCCGTGAGTTCATGGCCCATGAGGCCACATGAGGCGGCTAC
CAACCTGCCCCGTGGTGGGCCCAAGGAGATCGTGGCCCTCCTGCGACAAGTGCCAGTGGACTGCTCCCCGGCA
TCTGGCAGCTGGACTGACCTGÇCGTGGGCCTGGÇCGTGGGCCAGCTGGÁGTTCGGGAGGGCAGCATCCTGGAGÇCGTGATCATCGAGGCGGAGTGATCCCCGCGAGACC
GGCCAGGAGAGCCGCGCCTACTTCAAGAGGAGTTCGGÇCGCÂTCCTGGAGGGCAAGATCATCCGCGCCTACACAACGCCTCCAACTTCACCTCCACCGTGGTGAA
GGCCGGCGCCTCAGGGGCCGAGCGCCGAGCACCCCGAGAGTCCCCAGTCCCCAGTÇCCATGAÂCGCCAAGGGGCGGCTAC
TCATCGGCCGAGCGCCATCATCGÁCACATCATCGCCGÇCGGCATCATCGCCGÇCGACATCATCGÇCGÂGAAGCTGCÂCCAAGGATÇCAGAACAÂCGAGATCAAGGTGGTGCCCCC
CGACTCCCGCCGTGTGGAAGGGCCCCGÁCCGTGTGTGGAAGGGCCCGÁCTGCCGCGAGATGCCGAGÂGCGCCAÂGCGCÇAGAÇAACAÂCGAGATCAAGGTGGTGCCCCC
GCCCGCAAGGCCAAGATCATCCGCGACTACGGÇCAAGCAGÂGATGÇCGÇCGÇGÇCGÁCTGGCÇTGTÇGGÇCGÁCTGGGÇCGÂGÂCCAÂGGAÇGÁGÁGÁCTAA
```

Fig. 116B

2003_CON_G_pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGGCCCGGCCAACTCCCCCACCCGCCCGCGAGCTGCGCGTGCG
CCGCGGCGACTCCCCCCTGCCCCGGAGGGCCGGAGGGCGCCGAGGGCCATCTCCCCAGATCACCCTGTGGCAGCGCCCCTGGTGACCG
TGAAGATCGGCGGCGCCAGCTGATCGAGGGCCTGCTGACGACACCGTGCTGGAGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGATCGAGATCTCCGGCAAGAGGCCATCGCGGCACCGTGCTGGTGGGCCCCAC
CCCCATCAACATCATCGGCGCCAACATCGGTCGACCCTGAACTTCCCCATCTCCCCCAGACTTCCCCACCCTGACCGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
GCATGGACGCGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
AAGATCGGCCCCGAGACCCCTACAACACCCCATCTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGACGCCTACT
GCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCCCGCCTTCACCATCCCCTCCACCAACTACCGCGGCCCCGTGCTGGGGCGACGCCTACT
TCTCCGTGCCCCTGGACGAGGAACTTCCGCCAGAGAGAAGTCCGTGACCGTGCTGGGCTACAACGTGCTG
CCCCAGGGCTGGAAGGGCTCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCACCCAGAACCCCGAGATCGTGATCTACCAGTA
CATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGCCAGCACCTGCTGCGCTGGGGCCTCTTCACCACCC
CCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCCGACAAGGAG
TCCTGGACCGTGAACGACCTCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGAAGCAGCTGTGCAAGCTGCTGCG
CGGCGCCAAGGCCCTGACCGAGATCGTGCCCCTGACCGAGGAGCTGGAGCTGGAGCAGAACGTGGGGAAGCGTGGTGACCAGTGCACCGGCGTGT
ACTACGACGCCCCTCCAAGGCGGCGCGATCGCCGCCGAGGTGCAGAAGCAGCTGACCCGAGGTGGTGACCAGCAGCCGCCTACCAGGAGGCCCTACAAGAACCTGAAGACC
GGCAAGTACGCCCGCATGCGCGGCGCCCATCCCCTGGGGGGAGCCCACCGAGGTGTGCAGAAGATCGCCCACCTGGATCTGTCATCGTGGGGCAA
GACCCCCAAGTTCAAGCTGCCCATCCAGAAGGAGACCTGGGAGGTGTGGTGGACCGAGTACTGGCAGGCCACCTGGATCCCGGAGTGGGAGTTCGTGAACA
CCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGCCCCTGGGTGGACCAGAGATCAATCACCCTGACCGAGACCACCAACCAGAAGGCCGAGCTGCCACCTGGCCCT
GGCAAGGCCGGCTACGTGGACCGAGGTGAACATCGTGACCGACGACTCCCAGTACGCCCTGGGTGGCCCCGCCAGAGGAGCGCATCGGCGCAACGAGGCGCATCGGCAACGAGAGCAGGTGGTGAACC
GCAGGACTCCGGCTGGAGGTGAACATCGTGACCGACGACTCCCAGTACGCCCTGGGTGGCCCCGCCAGAGGAGCGCATCGGCGCAACGAGGCGCATCGGCAACGAGAGCAGGTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGGCCGCTACCTCCAACTTCAA
TCCGCATCCCCCCATCGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGGCATGGCCCATCGGCGGCCTACACTGGACTGGGACTGCTCCCCCGGCATCT
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCGTGCACGTGGCCAGCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACCGGC
CAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCCGTGAAGGTGATCCAACCCCCAGTCCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
CGCCTGCTGGTGGGCACCGCATCATCGCCGGCCAACAATCACCCAGGAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGGCAGGTGCGCGACCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTACTCC
GCCGGGCGAGCGCATCGTGGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAACTTCCGCGTGTACTACCGGA
CTCCCCGCGATCGTGGCGGGACCTGAAGGGCCCAAGCAGCTGAAGGCCAAGCAGATGGCCGTGTTCATCCACAACTTCAAGGACAACAACGAGGCGGCATCGGCGGCTACTCC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACTGCGTGGCCGGCAGGCAGCGCAGCGGCGGCGACTGAA

Fig. 117A

74. 2003_CON_B_pol.PEP

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FFRENLAFQQREARKFSPEQARANSPTSRELRVRRGDDPLSEAGAEGQGTSLSFPQITIMQRPLVTVKIEGQLREALLDTGADDTVLEEINL
PGKWKPKMIGGIGGFIKVRQYEQVAIEICGKKAIGTVLVGPTPVNIIGRNILTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKI
KALTEICIEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVSVLDVGDAYFSVPLDKD
FRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEMIIYQYMDDLYVGSDLEIGQHRAKIEELRAHLLRWGFT
TPDKKHQKEPPFLWMGYELHPDKWTVQPVKLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTKEAELELAENR
EILREPVHGVYYDPSKDLIAEIQKQGPDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIATESIVIWGKIPKFRLPIQKETWE
TWWTEHWQATWIPEWEFVNTPHLVKLMWYQLETEPLAGAETYYVDGAANRETKIGKAGYVTDRGKQKVVSLTETTNQKTELQAIYLALQDSGL
EVNIVTDSQYALGIIQAQPDKSESELVNQIIEELIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHNNWRAMA
SDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKMIHT
DNGSNFTSAAVKAACWWADIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLRTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATD
IQTKELQKQISKIQKFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 118A

75. 2003_CON_01_AE_pol.PEP

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FFRENLAFQQGKAGEFSSEQTRANSPTSRKLGDGGGRDNLLTEAGAERQGTSSSFSFPQITIWQRPLVTVKIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIDTVPVTLKPGMDGPKVKQWPLTEE
KIKALTEICKEMEEEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
ESFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRIKNPEMVIYQYMDDLYVGSDLEIGQHRTKIEELRAHLLSWG
FTTPDKKHQKEPPFLWMGYELHPDRWTVQPIELPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVPLTEEAELELAE
NREILKTPVHGVYYDPSKDLVAEVQKQGQDQWTYQIYQEPFKNLKTGKYARKRSAHTNDVRQLTEVVQKIATESIVIWGKTPKFRLPIQRET
WETWWMEYWQATWIPEWEFVNTPPLVKLWYQLEKDPIVGAETFYVDGAASRETKLGKAGYVTDRGRQKVVSLTETTNQKTELHAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDRSESEVVNQIIEELIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLELDGIDKAQEEHERYHSNWRT
MASDENLPPIVAKEIVANCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVI
HTDNGSNFTSAAVKAACWWANVRQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 117B

2003_CON_H_pol.OPT

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TTCTTCCGCGAGGAACCTGGCCTTCCAGCAGCGCGAGCCCGCCAAGTTCTCCCCGAGCAGGCCCGCCAACTCCCCCACCTCCCCGAGCTGCGCGTGCG
CCGCGGCGACGACCCCGTGTCCGGAGGCGGCGGCGCCGGAGGCCCAGGGCCAGGGCCAGGGCCACCTCCCTGTCCTTCCCGGAGGAGATCAACCTGCTGGAGCGGCCCCCTGTGGCAGCCGTGA
AGATCGAGGGCGACGACCCCCTGTCCGGAGGCCCCTGCTGACACCGGCCGACACCGGCCGAGTGCGCCAGTACGACGAGCAGTCTGGGCAAGATCTGCGCCATCGGGAGGAGATCAACCTGCTGGGAGCCCAGAGATC
GGCGGCATCGGCGGCTTCATCAAGTGCGCCAGTACGACGAGCAGTCTGGGCAAGATCTGCGCCATCGGGAGGAGATCTGCGGCAAGTGGAAGTGGAAGTGGGCCCCCACCCC
CGTGAACATCATCGCCGCCAACATCCTGAACCTGCTGCACCCTGAACTTCCCCATCTCCCCCATCGAGACGTGGCTGCACCGTGCCCGTGAAGCTGAAGCCCGGCA
TGGACGGCCCCAAGGTGAAGCAGTAGTGGCCCCCTGACCGAGGAGAGATCAAGGCCCTGACCGAGATCGCATCGAGATGGAGAAGAGGAGGCAAGATCTCCAAG
ATCGGCCCCGAGAACCCTACAACACCCCCATCCTTCGCCATCAAGAGAAGAGGACTCCACCAAGTGGCCAAGTGGTGGACTTCCGCGAGCTGAACAAGCG
CACCCAGGACTTCTGGGAGTGCAGCTGGCATCCCCAGCTGGCATCACACGGCCTTCACCATCCCCTGCTCCGAGTGGCCCTTCACCATCCGCCGTACCAACGTGCTGCCC
CCGTGCCCCTGGACAAGGACTTCCGCCAAGTCCTCCATGACCAAGATCCTGGAGCCCAAGAGCAGACCCCGAGATGCATCTACCAGTACAT
CAGGGCTGGAAGGGCTCCCCCGCGCCTCCCCCATCTTCCAGTCCTGGAGATCGGCCAGACCGGCCAAGAGCTGCGCGCGCTGGGGCTTCACCACCCCG
GGACGACCTGTACGTGGGCTCCGAGATCGGCCAGATGGGCTACGAGCTGAACTGGGCCCTGACCGGCCGTGAAGCAGCCGTGTGCAAGCTGCTGCGCGGG
ACAAGAAGCACCAGAAGGAGCCCCCTTCCGTGTGGCAAGCTGACAATCCCCCGGCCAGCCTGAACTGGGCCTGGAGCTGAAGGTGGACCCCCGCGAGAACCGCGAGAAGGACTCC
TGGAACCGTGAACGCCCTGAAGAGCTGTACGTGCCCCTGACCGAGATCGCGGCCATCAACCGCGAGATCGGCCATCAACCCCGGCCATCAAGTGAAGCAGCTGTGCAAGCTGCTGCGCGGG
CGCCAAGGCCCTGACCGAGACATCGTGACCCCCTCCAAGGACCTGATCGCCGAGATCCCAGAGGAGCCCCAGGGCCCCGAGATCTGGCCGAGACCTGGCACGCCGTGTACT
ACGACCCCTCCAAGGACCTGATCGCCGAGATCCCAGAGGAGCAGCAGGGCCCGAGATCTACCAGGATCTACCAGGACCCCTCCTTCAAGAACCTGAAGACCGGC
AAGTACGCCCAAGATGCGCCGCCCCACCAACGAGGACCTGGAGAACCAGACCGTGCAGCACTGGGACCTGACCGAGATCCCGAGTCCCCGCCGCCAAGATCGGC
CCCAAGTTCCGCCTGCCCCATCCCAGCGAGAAGGAGGCCGGCCACTGGACCGTGCCGGGGCCAGGGCCATCACCTGGCCCTGCA
CCCAAGTCTGGTGAAGCTGTGGTGACCGAGACCGGGCAAGCGCGGCGAGCCCATCTGGGGGCCGAGGGTTCGTGAACACCC
AAGGCCCGGCTACGTGACCGGCCGCCGGCCAAGGAGGTGGTTGTCCCTGACCGAGAAGACCAGAGACCAGAAGACCAGAAGATCGGC
GGACTCCCGGCCTGGAGGTGAACATCGTGACCGGCTGGACCTGGAGAACCAGACCGTGCACCTGACCTACCTGGCCCTGCA
TCATCGAGGAGCTGATCAACGAAGAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAGGTTGGTGAACCAGA
GGCATCCGCAAGGTGCTGTTCCTGGACGGGCCATCGTGCCCTCCCTGCGACAAGGCCCTGGACGCGCCCATCTCCGACTTCAACCT
GCCCCCCATCGTGGGCCAAGGAGATCGTTGGCCTCCTGCGCCGTGGCCGTGAGGGCCCAGAGTGCCCATGGGCGCCATCTGGCC
AGCTGGACTGCACCCTGGCCCTGCGACATCATCGCCGCCACCGACAACCAGACCAAGGAGGCGCTGCTCCCCCGGCCGGCCGCCAG
GAGACCGGCCTACTTCATCCTGAAGGTGAGCTGCGCCCGTGCCGTGATCCCCGTGAAGATGATCCCCCAGTCCCAGTCGTGGGAGTGGGAGTGGAAGGGCGGCTACTCCGCCGACTC
CTGCTGGACTGGTGGGGCGCGAGATCCAGGCCAGGCCGCCACCTCCGGGAGTGGCGTGGAGAGCTGCGCACGTGTCCGGCACCCGGCACCGGCCGG
GCCGAGCGCCATCATCCGCCGACACCTGGCCCTGGTCCCTGGCCCATCATCCAGGAGGGCGGCTACTCCGCCGACTC
CCGCGACCCCATCTGGACCAGCAGATCATCCCCGGACTACGGCAAGCAGCAGATGGCCGGCGACTGCGTTGGTGGAAGGTGGTGCCCGCGCA
AGGCCAAGGATCATCCCGGACTACGGCAAGCAGCAGATGGCCGGCGACTGCGTTGGTGGAAGGGGCGGACGACGAGGAGGACTAA
```

Fig. 118B

2003_CON_01_AE pol.OPT

TTCTTCCGCGAGAGAACCTGGCCTTCCAGCAGGCAAGGCCGGCGAGTTCTCCTCCGAGCAGACCCGGCCCAACTCCCCCACCTCCCGCAAGCTGGGCGACGG
CGGCCGCGGACAACCTGCTGACCGAGGCCGGCGAGCGCCAGGGCGCCGAGGCGCTGAGGAGCCCTGCTGGACACCGGCCCTGCTGGAGGACACCTGCAGCGCCCCTGGTGA
CCGTGAAGATCGGCGGCCATCGGCGGCTTCATCAAGGTGCCGCCAGTACCAGATCCTGATGCGGCAGATCCTGAGATCGACGAGACTTCCCCATCTCCCCATCTCCCCGAGCCAAG
ATGATCGGCGGCCATCGGCGGCTTCATCAAGGTGCCGCCAGTACCAGATCCTGATGCGGCAGATCCTGAGATCGACGAGACTTCCCCATCTCCCCATCTCCCCGTGCTGGTGGGCCCC
CACCCCCGTGAACATCATCGGCCGCAACATGCTGGCCCCAAGGTGAACGAGCAGTCAGTGCCCTGACCGAGGAGATCAAGGCCCTGACCGAGATCTGCAAGGAGATGGAGGAGGGCAAGATC
CCGGCCATGGACGGCCCCCAAGGTGAACGAGCAGTCAGTGCCCTGACCGAGGAGATCAAGGCCCTGACCGAGATCTGCAAGGAGATGGAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACACACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACGTTCCGCGAGCTGAA
CAAGGCCACCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCAAGGTGCAGCTCCTTCCGCAAGTACACCCCCTTCACCATCCCCGCCTTCACCATGACCAGTACCAGAT
ACTTCCGTGCCCCAGGGCTGGAAGGGCTCCCCGCCATCTTCCAGTGCCTCCTGCCAAGATCCTGGAGCCTTCCGCATCAAGAACCCCGAGATGGTGATCTACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGACAGATCGAGGAGCTGCGCCACCTGCTGTCCTGGGGCCTTCACCA
CCCCCGACAAGAAGCACCAGAGAAGGAGCCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGCCTGAACTGGCCCCAGATCTACGGCCTGAGCTGCT
GACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCCAAGCTGAACTGGGCCTGAGCTGGCCCCAGATCTACGGCCTGAGCTGCT
GCGCGGCGCAAGGCCCTGACCGACATCGTGCCCCTGACCGAGGAGGCCGCCGAGATCCTGGCCGAGAACCGCCGTGACGGCG
TGTACTACGACCCCTCCAAGGACCTGGTGGCCGAGGTGCAGAAGCTGGTGGGAGCTGGGATGCGCCCGAGGTGGGAGTTCGTGA
ACCGGCAAGTACGCCCGCATGAGGGCCTTCCAGGTGAAGCTGTGGTACCAGCTGGAGAAGGACCCCATCGTGGGCGCCTGGAAGGACCCCAAG
CAAGAGATACGCCCCCAAGTTCCGCCTGCCCATCCAGCCGCAGGAGATGGGCCAGGACCTGGTGGGAGGACTACTGGGATGTGTCCCTGACCGAGACCGGCTGCACGCCACCTGGC
CTGGGCAAGGCCGGCTACGTGACCGACCGGGGCCGCCAAGGTGGTCCCTGACCGAGAGCTGCCTGGGCATCGTGGCCGAGGTGGTGA
CCTGCAGGACTCGGCCTGGAGGTGAACATCGTGACCGACAGCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACGTGGAGCTGAACATCGTGACC
ACCAGATCATCGAGGAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGAGGCACACCATGGCCACCAGCTGGTG
TCCTTCCGGCATCGGCGGACGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACAGCAACTGGCGCGCGGCCATGGCCTCCGACTT
CAACCTGCCCCCAATCGTGGCCAAGGAGATCGTGGCCAGCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGGCTGCTCCCCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCCGTGAAGGTGATCCAAACCCCCCAGTCCCCTACACAACCCGTGCGGAGCTGAAGAGA
GGCCAGGAGACCGGCCTACTTCCTGCTGAAGGCTGGGCCCCGTGGGGTGGGCGCCGAGGTCCTGGAGGTGAGTCCATGAACGAAGAGCTGAAGAAGA
GGCCGGCCTGCTGCAGGTCGCCGAGGCCATCATCGACATCATCGCCGCCCCCATCTACGAGCAGGAGGAGCTGCTGGGCTGGGCCATGGTGGTGCCCAAGGTGTACGGCTAC
TCATCGGCCGGCTGGGGTGGGCGCGGCCATCATCGACACAATCGCCGCCCCCATCTACGAGCAGGAGGAGCTGCTGGGCTGGGCCATGGTGGTGCCCAAGGTGTACGGCTAC
TCCGCCCGGCGAGCCGATCATCGACACCAGCAACCGGAGAATCCAGAAGCTGCAGAAGCAGATCCAGAAGATCCAGAACTTCCGCGTGTACTACCG
CGACTCCCGCGACCCCATCTGGAAGGGCCCAGGCCCAGGCTGCGTGTGGTGGAAGGGCGAGGGCCGGGCCGTGCGTGGGCCGCCAGGAGGACTAA
GCCGGCAAGGCCAGAGATCATCCGCGGCCAAGGCCCAGTACGGCACGGCAAGCAGATGGCCGGCGTGCGTGGCCGGCGACGAGGACTAA

Fig. 119A

76. 2003_CON_02_AG pol.PEP

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FFRENLAFQQGEARKFSSEQTGTNSPTSRELWDGGRDNLLSEAGTEGQGTISSFNFPQITLWQRPLVTVRIGGQLIEALLDTGADDTVLEEI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTDICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQASMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVTLTEEAELELAE
NREILKEPVHGVYYDPTKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEVVQKVATESIVIWGKTPKFRLPIQRET
WEAWWMEYWQATWIPEWEFVNTPPLVKLWYQLEKDPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELHAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIEKDKVYLSWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHERYHSNWRA
MASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVI
HTDNGSNFTSAAVKAACWWANVTQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
SDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
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Fig. 120A

77. 2003_CON_03_AB pol.PEP

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FFRENLAFQQREARKFSSEQTRAISPTSRKLWDGGRDNPLPETGTERQGTASSFNFPQITLWQRPLVTVRIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVTLKPGMDGPKVKQWPLTEE
KIKALTDICKEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
QDFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVRQLCKLLRGAKALTEVIPLTAEAELELAE
NREILKEPVHGVYYDPSKDLVAEIQKQGQGQWTYQIYQEPFKNLKTGKYARLRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFKLPIQKET
WETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKSGKAGYVTDRGRQKVVSLTDTTNQKTELQAIHLALQDS
GLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSAGIRKVLFLDGIDKAQEAHEKYHSNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFVLKLAGRWPVKII
HTDNGSNFISTAVKAACWWAGIKQEFGIPYNPQSQGVVESMNKQLKQIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNNDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED$
```

Fig. 119B

2003_CON_02_AG pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCAAGTTCTCCTCCGAGCAGACCGGCACCAACTCCCCACCTCCCGCGAGCTGTGGGACGG
CGGCCGCGACAACCTGCTGTCCGAGGCCGGCCGAGGGCCAGGGCCGAGGGCCAGCGCCGAGGGCCGAGCGCCCCTGGTGA
CCGTGCGCGATCGGCGGCCAGCTGGTGGCTTCATCGAGGCCGTGCTGACGACACCGGCCGCCTGCCCGGCAAGTGGAAGCCCAAGC
ATGATCGGCGGCATCGGCGGCTTCATCGAGGCCTGGGCGGCTTCATCGAGGTGCGCCAGTACGACGACCTGCTGGCGCCATCGGCCACCGTGCTGGTGGGCCC
CACCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGATCGGCTGCACCCTGCACCCTGAACTTCCCCATCTCCCATCTGACCGACATCTGCACCGAGCTGAAGC
CCGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAGATCAAGGCCCTGACCGAGATGATGGAGAAGGAGGCAAGATC
TCCAAGATCGGCCCGGAGAACCCCTACAACACCCCGGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCCGGCCTGAAGAAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGGACAAGGACTTCCGCAAGTACACCGCCTTCACCATCCCCTCCGTGAACAACGAGAGACCCCGGCATCCGCTACCAGTACAACGTG
CTGCCCCAGGGCTGGAAGGGCCTCCCCCCGCCATCTTCCAGGCCGTCCCATGCACCAAGAGAGATCCTGGAGCCCTGGACCCCGCCAAGATCGTGATCTACCA
GTACATGGACGACCTGTACGTGGGGCTCCGGACCTGGATGGGCTACGAGCTGCACCCCAGATCTACGCCTGGGCCTGAGAGCTGCT
CCCCCGGACAAGAGCACCAGAGGAGCCCCTTCCTGTGGATGGGCCAAGCTGATCCCCGACCTGGAGCTGAACTGGGCCGAGCTGCCGTGCACGGCG
GACTCCTGGACCGTGTACGTGGAAGCGCTGAACGACGACGACCCTGCACCGAGCTGCCGAGCTGAAGTGAAGCAGCTGTGTGCAAGCTGCT
GCGGCGGCATCGTGACCCTGACCGAGGCCCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGTGCACGGCGTGTACTACGACCCCAGGAGAGATCGCCGGCAGGCCTGATCGCCCCAGATCTACGCCTGAAGAACCTGAAG
ACGGCAAGTACGCCAAGATGCGCTCCGCCCACACCAACGGCTGTGGAAGCAGGTGGTGCGAGGTGGACCAGGAGTTCGTGA
CAAGAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGACACCTGGGAGGCCTGGTGGGCGCCCAGATCCCGAGTGGGAGTTCGTGA
ACACCCCCCCCTGGGTGAAGCTGTGGTACCAGCTGGAGAAGGACCCCATCGTGGGCGCCCAGATGGTGTCCTGACCTACGTACCTGTCTGGGTGCCGCCATCCACCTGGC
CCTGCAGGACTCCGGGTGAAGCTGACCGATGGGCCGCGGCCCATCGTGACCCCGGCCCTGGGTGCCCGACTACGCCCCTGGGGTGCCCCAGTCCGAGCTGGTGA
ACCAGATCATCGGAAGCTGATCGAGAAGAGGACAAGGTGTACCTGGCCCTGGGTGGTCCCCAGTACGCCCCTGGGGTGCCCCAGTCCGAGCTGGACAAGCTGGTG
TCCAACGGCATCGCCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCGCAACGAGAGCGACAGCCCCAGTCCCATGCGCGCCATGGCCGGCCTGGCCCTGCGCTCCCCCGCAC
CAACCTGCCCCCATCGTGCCCAAGGAGATCGTGGCCTCCTGCGACAAGAGCTGGCCTCGAGGCAAGTCGCCCAGTGCCAGTGACTGACCTGCTCCCCGCCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCCTGGCCGTGGCCTGCTGGGCGTGCTGGGGCACGTGCTACGTGCCCGAGACC
GGCAGGAGAGACCGCGCCTACTTCATCCTGAAGCTGGCCGGTGGGCCAAGCTGGCCCGTGCGCATCGCCGCCGAGAGTCGTGGTGA
GGCCGCCTGCTGGTGGGCAAGTGCTGTTCCTGGACGGCATCGACAAGGCGCAACGAGTTCGGGAGTCCATGAACAACAAGGAGAGCTGAAGAGA
TCATCGGCCGCAGGTGCGCCACCAGCCGCACCTGAAGAGAGAGACCTGAAGAGACCCGTGTTCATCCACAACTTCAAGCGCGGCATCGGCGGCTAC
TCCGGCGGCAGCGCCATCATCGACACCGCTCGCCTCCGACTGGCCCGCCCGGAGGGCCGTGGTGAAGGGCCGTGGTGAACTTCCGCGTGTACTACCG
CGACTCCCGCGACCCCATCTGGAAGGGCCCGGCCCCCAACGACAGATCCAGAACTCCGACAACTCCCAGATCAAGGTGGTGCCCCG
GCCGCCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGGCCGGCCTGCTGGTGGCCGTGCACGTGGCCGAGGACGACTAA
```

Fig. 120B

2003_CON_03_AB pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCAGCAGCGGCGGAGGCCCGGAGGCCCGCCAGTTCTCCTCCGAGCAGCACCCGGCGACCCCGCCATCTCCCCACCTCCCGCAAGCTGTGGGACGG
CGGCCGCGGACAACCCCCCTGCCCCGAGACCCGGCCACCGCCGAGCGCCGAGGGCGCCACCGCCCTGCTGGACACACCGGCCCTGACGCCCTGTGTGGCCAGCGCAAGTGGAAGCCCAAG
CCGTGCTGCGCATCGGCGCGGCCCAGCTGAAGGAGGCCCTTCATCAAGGTGCGCCAGTAGCCAGAATCCTGACCCGTGCTGGGACATCAACCTGCCCGGCAAGTGGAAGCCCAAG
ATGATCGGCGGGCATCGGCGGCTTCATCAAGGTGCGCCGCCAACATGCTGGGCGTTGGGCGCTTCATCAAGGTGCGCCGCCAACATGCTGGGCGTTGGGC
CACCCCGTGAACATCATCGGCCGCCAACATGCTGGGCGTTGGGCGCTTCATCAAGGTGCGCCAGTTGCGCCAACATGCTGGGCGTTGGGC
CCGGCATGGGACGGCCCCCAAGGTGAAGCAGTGGCCCCTGACCAGGAGAAGATCAAGGCCCTGACCCGTGCTGGGACATCTGCAAGGAGAAGATCAAGGCCCTGAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACACAACACCCCGTGTTCGCCATCAAGAAGAAGACTCCACCAAGTGGCGCCAAGCTGGTGGCGTGCGCCAAGCTTCCGCGAGCTGAA
CAAGCGGCACCCAGGACTTCTGGGAGGTGCAGCTGGCATCCCCACCCCGCCCGGCGCTGGGAGGTGCAGCTGGCAGCTGGCCTGGACGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGGACCAGGACTTCCGCAAGTACTACCCCGCCTTCACCATCCCTTCACCATCCGCCTTCACCATCCGCTACCAGTACAACGTG
CTGCCCCAGGGCTGGAAGGGCTCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCTTCCGCAAGCAGAACCCCGAGATCGTGATCTACCA
GTACATGACGACCTGTACGTGGGCTTCCGACCTGGGGCTCCGACGAGATCGGCCAGCAACGACCGCCGCAGCTGCGCGAGCACCTGCTGCGCGAGCTTCCACCA
CCCCCGACAAGAAGCACCAGAGAAGCACCCCCCTTCCTGTGATGGCTACGAGCTGACCCCGACATCTACCGCCGGCCTCCCGAGATCTAGCGCCGGGCATCATCAAGGTGCGCCAGTCGCTGCAAGCTGCT
GACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCCAAGCTGAACTGGGCCTCCCGAGATCTAGCGCCGGGCATCATCAAGGTGCGCCAGCTGTGCAAGCTGCT
GCGCGGCGGCCAAGGGCCTGAGCGGCGTGATCCCCCTGACCGCCGAGGCTGAACTGGGCCTGAGCTGGGCCAGCTGCCGAGATCCTGGAGATCCTGAAGAACCTGAAG
TGTACTACGACCCCTCCAAGGACCTGGTGGCCGCCGAGATCCAGAAGAGCCAGGGCGCCCAGGAGATCCAGAACCTGAGAAGCAGAGGCTGGAAGAGCCAGGGCCCCTTCAAGAACCTGAAG
ACGGCCAAGTACGCCCCGCTGCGGCGCCCCACACCAACAGACACCCGAGAAGATCGACACCCGAGAAGATCGACACCCGAGAAGATCGCCCACCTGGATCCCCGAGTTCGTGA
CAAGAGACCCCCAAGTTCAAGCTGCCCATCCAGAAGGAGAGGAGCTGGAGAAGGAGAGCCCATCGTGGGCCGCCAACCGCGAGACCAAGGAGACCAACCGCGAGACCAAG
ACACCCCCCCCTGGTGAAGCTGTGGTACCAGCTGCGGTACCAGCGGTACCAGCTGGAGAAGGAGAGCCGGTACCAGCTGGAGAAGGAGAGCCCATCGTGGGCCGCCAACCGCGAGACCAAG
TCCGGCAAGGCCGGCTACGTGACCGTACGTGACCGTGAAGGTTGTGTGTCCCTGACCGGCCCCAGGAGAAGGTTGTGTGTCCCTGACCCAGCTGGCGCCATCCACCCTGGC
CCTGCAGGACTCCGGCCTGGAGGTGAACATCGTGACCGACTCCCAGTTCATCGTGACCGACTCCCAGTTCCTGGGCCATCATCGTGACCGACTCCCAGTCCGAGCTGGTGT
CCCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGGCCCGCCGCCGCCGCCGCCCCCGCCATCGGCGGCATCGGCGGCAACGAGCAGCTGGTG
TCCGCCGGCATCGGCGTGCTGTTCCTGACGGTGCTGTTCCTGACGGGCCATCGACGAGCATCGGCGGCATCGGCGGAGTACCACTCCAACTGGCCTCCGACTT
CAACCTGCCCCAAGTTCAAGCTGCCCATCATCGCCGGCAAGTGCCGTGCCGTGCCGTGCCGTGCCGTGCAGGGAGGGCGAGGGCCATCGACGTGGGACTGGAGTTCGTGA
TCTGGCAGCTGGAAGCTGTGTGGTACCGCTGGTGTGGTACCGCTGGTGTGGTACCGCTGGTGTGGTACCGCTGGTGTGGTACCGCTGAGGTGATCCTCATCTCCACCGCCGTGAA
GGCCAGGAGAGACCGGCCTACTTCGTGCTGCTGAAGCTGTGCTGAAGCTGTGCTGAAGCTGTGCTGAAGCTGTGCTGAAGCTGTGAAGTCCATGAACAAGCAGCTGAAGCAGA
GGCCGGCCTGCTGGTGGGCGGCCATCATCTCGGCCATCATCTCGGCGTGTGGAGTCCATGAACAAGCAGCTGAAGCAGAGTCCATGAACAAGCAGCTGAAGCAGA
TCATCGGCCGGCCAGGTGCGCGACCAGGCCGAGCATCATCGACATCATCGACAATTCAAGCGCAAGTTCCACCAACTTCAAGCGCGGCATCGGCGGCATCGGCGGCTAC
TCCGCCGGCGAGCCGACCATCATCGACACCATCGCCGCCGCCGCCGCCGCCGCCGCCGAGGAGCTGCAGAAGCAGATCCAGAAGAGCTGCAGAACAACGACAATCAAGGTGCTGTACTACCG
CGACTCCGGACTGGACTACGTGCGGCCGCTACGGCGCCGAGATGCCCGGGCGACTGCGTCTGGCCGTGGAAGGGCGGCGTGCGTGGGCGTGCTCCCCGCCAGGACGGAGGACGGAGGA
GCCGGCAAGGCCCAAGATCATCCGCGACTACGGCGGCCAAGATGCCCGGGCGACTGCGTGGCCGTGGAAGGGCGGCGTGCGTGGGCGTGCTCCCCGCCAGGACGGAGGAGGACTAA
```

Fig. 121A

78. 2003_CON_04_CPX pol.PEP

FFRENVAFQQREARKFSSEQARANSPARRELRDERGDNLLSEAGTEGQGTISFNFPQITLWQRPLVTIKIGGQIREALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQIPIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKNSTRWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDP
EFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGF
STPDKKHQKEPPFLWMGYELHPDKWTVQPIQLAEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTTEAELELAEN
REILKEPVHGAYYDPSKDLIAEIQKQGQGQWTYQIYQEPYKNLKTGKYAKTRSAHTNDVRQLTEAVQKIAMECIVIWGKTPKFRLPIQKETW
DTWWTEYWQATWIPEWEFVNTPPLVKLWYQLETDPIAGAETFYVDGAASRETKQGKAGYVTDRGRQKVVSLSETTNQKTELQAIYLALQDSG
SEVNIVTDSQYAIGIIQAQPDRSESDLVNQIIEQLIQKDKVYLSWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHEKYHNNWRAM
ASDFNLPPVVAKEIVASCNKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKIIH
TDNGPNFTSAAVKAACWWADIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 122A

79. 2003_CON_06_CPX pol.PEP

FFRENLAFQQGEAREFSSEQARANSPTRRELRVRRGDSPLPEAGAEGQGAISLSFPQITLWQRPLVTVRIGGQLIEALLDTGADDTVLEDIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMIKILEPERIKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPHKNLKTGKYARIKSAHTNDVKQLTEAVQKIALESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIVGAETFYVDGAANRETKKGKAGYVTDRGRQKVVSLTETTNQKTELQAINLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGIDKAQEDHERYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWANITQEEGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 121B

2003_CON_04_CPX pol.OPT

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TTCTTCCGCGAGAACGTGGCCTTCCAGCAGCGGCGAGGCCCGGCCAAGTTCTCCTCCGAGCAGGCCCGGCCCGGCGAGCTGCGGCGACGA
GCGGCGGCGACAACCTGCTGCTCCGAGGCGCGGCCAGGAGGGCCCAGGAGGGCCAGGAGGGCCACCGAGATCTCCTTCAACTTCCCCAGATCACCCTGTGGCAGGCGCCCCTGGTGACCA
TCAAGATCGGCGGCCAGATCCGCGGAGGCCCTGGTGGACACCGGCGGCCGACAACCTGCTGCTGGAGGAGATCAACCGTGGCACCGTGCTGGTGGGCCCAC
ATCGGGGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCCCATCGAGATCTGCGGCAAGAGGCCATCGGCACCGTGCCCGTGAAGCTGAAGCCCG
CCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGCTGGGCTGGGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
GCATGGACGCGCCCAAGGTGAAGCAGTAGCCCCTGAACCCCTACACACCCCATCTTCGCCATCAAGAAGAAGAACTCCACCCCGCTGGCGCAGCTGGTGGACTTCCGCGAGCTGAACAA
AAGATCGGCCCCGAGAACTTCTGGGAGGTGCAGCTGGCATCCCCAGTGGGCATCCCCGGCCTTCACCATCCCCTCCAACAACGAGAGTCCGTGACCGTGGGCGACGCCTACT
GCGCACCCAGGAGGACTTCTGGGAGGTGCAGCTGGCAAGTTCCGCCAAGTCCTCCATGACCGAGCCCTTCCGCACCAAGAGAACCCCGAGATCGTGATCTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCCGAGAGCTGAACGACACATCCAGAAGCTGGTGCCCCTGACCGAGGCCGAGCTGGCACCACCGTGCTGCGCCT
CATGGACGACCTGTACGTGGGCTCCGACCTGGCTCCGGTGATGGGCTACGACCTGCACCGTGCACCTGCGCGAGCAAGGAC
CCGACAAGAAGCACCAGAAGAGCACCCCCTTCCTGTGATGGGCTACGAGCTGCCCTCCAACTGGCCAGCGTGTGCAAGCTGCTGCG
TCCTGGACCGTGAACGACACATCCAGAAGCTGGTGCCCCTGACCGAGGCCGAGCTGGAACCTGAAAGACC
CGGCGCCAAGGCCCTGAACGATCCGCGACCATCGTGCCCGCCCCACCACCAGAGATCGCCGAGAAGATCGCCACCTGATCTGGGCAA
ACTACGACCTGTACCTGCCGCCTCCGCCCACACCAACGAGAAGGACCTGGACCGCGCCGAGAGATCGCCGAGAAGATCGCCACCTGATCTGGGCAA
GGCAAGTAGGCCAAGACCCGCCTCCGCCCATCCAGAGGAGGAGGACCTGGAGAGGCAGACCTGGACCTGATCGCCGCCACCTGGAGGAGGTTCGTGAACA
GACCCCCCCCCGTGGTACGGCTACGTGACCGACCGGCGCCGCAGAAGGTGGTTCCCTGTCCGAGACGCCATCCAGGCCCATCTACCTGCCCT
GGCAAGGCCGGGCTACGTCCGAGGTGAACATCGTGACCGCTCCGAGGTGAACATCGTGACCGACTCCGAGTCCGACCTGGTGAACC
GCAGGAGGACTCGGGCTCCGAGGTGAACATCGTGATCTCAGCAGCTGAACGAGGGCATCGGCGGCAACAGCTGGTGTCC
AGATCATCGAGCAGCTGATCGACCAAGGTGCTGTTCCTGGAGGACAGCCCCAGGAGAGCACGAGAAGTACCACACAACAGCTGGTGTCC
AACGGCATCCACCGGCCAAGTTGCTCCTGCCAACAAGTGCCAGGCCATGCGCAGGAGCTGCCAGTGACTGCTCCCCGGCATCT
CCTGCCCCCCGTGGTGGCCACCCACCTGTGGCCAAGATCATCGTGCCAACAAGTGCCAGTGACTGCCAGGCCGAGGTGATCCCCGCCGAGACCGGC
GGCAGCTGGACTGCACCCACTTCATCCTGAAGGGCAAGATCATCGGAGGGCAAGATCATCGGAGCTCCGAGCTGGAGCCGTGCGTGAAGGC
CAGGAGAGCCGCCTCCGTCATCCTGGCCAGCAGGTGCTGTTTCATCCAAGATGGCCGTGTTCATCCACAACTTCAAGCGCGGCTACTCC
CGCCTGCTGGTGGGCCGACCAGGCCCATCATCCGACATCATCGTGGCCCTGAAGGCGCCCAAGGAGCTGCAGAAGATCCAGAACTTCCGCGTGTACTACCGCGA
TCGGGCCGAGGCGCATCATCGACATCATCGTGGCCCTGAAGGCGCCCAAGGAGCTGCAGAAGATCCAGAACTTCCGCGTGTACTACCGCGA
GCCGGGCGAGCCGGCATCATCGGCATCATCCGACCTGTGGTGATCTCAGCGGCGCATCATCCGCGTGGTGTACTACCGCGA
CTCCCGCGACCCCATCTGGAAGGGCCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTCGTGGCCGGCGACGAGGACTAA
GCAAGGCCAAGATCATCCGCGACTACGCCAAGCAGACAGATGGCGGCGGGCCAAGCTGCGGTGGCCCCGCC
```

Fig. 122B

2003_CON_06_CPX pol.OPT

```
TTCTTCCGGGCGAGAACCTGGCCTTCCTCAGCAGGGCGAGGCCCGCGGCAGGCCCAACTCCCCCACCCCGCGGAGCTGCGCGTGCG
CCGGCGGCGACTCCCCCCTGCCCCGGAGGCCGGCGGCCGAGGGCCAGGGGCCAGGGCCCATCTCCCTGTCCTTCCCCAGATCACCCTGTGGCAGCGCCCCTGGTGACCG
TGCGCCATCGGCGCGGCCAGCTGATCGAGGGCCTGCTGGACACCGGCCCGACACCGGCCGCCAGTACCTGCCCGGCCAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGAGATCCTGATCAAGGTGCGCCGTGTGCTGGTGGCCCCAC
CCCCGTGAACATCATCGGCCGCAACATGGCTGACCTGCTGCACCCTGAACCTTCCCCCATCTCCCCGTGAAGCTGAAGCCCG
GCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACAACACCCCACCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGGGAGCTGAACAA
GCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCGGCCTGAAGGAAGAGTCCGTGACCGTGCTGGGCGACGGCCTACT
TCTCCGTGCCCCTGGACGAGGACTTCCGCAAGTACACCGCCTTCACCATCCCCTCAATGATCAAGATCCTGGAGGCCCTTCCGGATCGTGATCTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCCGGCCATCTTCCAGTCCTGAAGATCCTGGAGGCTCCTCCACCCC
CATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGTGCGCGAGCACCTGCTGAAGTGGGGCTTCACCACCC
CCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCGTGCTGCCCGAGAAGGAC
TCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGAAGCAGCTGTGCAAGCTGCTGCG
CGGCGCCAAGGCCCTGACCGACATCGTGCCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACGACGCGAGATCTACCAGGAGCCCCAACAAGAACCTGAAGACC
ACTACGGCGCCCCTGACACCCCCTCCCCCAAGAGACCTGATCGCCCCCACCACCAACGACGTGAAGCAGCTGACTGGGAGCAGGTGCGCGCCCTGAGTCCATCTGGGGCAA
GGCAAGTACGCCCGCCATCAAGTCGCCCCCAGAAGGAGACGTGGGAGATCGGCCCTGAAGATCGTGGGGAGTTCGTGAACA
GACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGGTGGTACCAGCTGGGCGCGCCGAGACCTTCTACGTGGGCGGCCGAGACCAAGAAG
GGCAAGGCCGGCTACGTGACCGACCGGCGCCGCCAGAAGGTGGTGCCCCTGACCCAGACCACCAACCAGAAGACCGAGCTGCAGGCCATCAACCTGGCCCT
GCAGGACTCCGGCCTCGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGTGCCCGCCAGGAGGCCAGGAGGCGTGGTGTCC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCGAGGTGGACAACCTGGCCCT
ACCGGCCATCCGGCCTGTTCGTGGACGGCAGCTCCCGCCTCGAGGAGATCGCCCGCGGAGGGCCTGCTCCCCCGGCATCT
CCTGCCCCCATCGTGGCCAAGGAGATCGTGGCCTCTTGCGACAAGTGTCAGCTGAAGGGCGAGGCGTGCGGCTGCCCGTGCTACTCC
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTCATCCTGGTGGCCGTGCACGTGGCTAGCGGCTACATCGAGGCGCTGCCCGAGACCGGCGC
CAGGAGGACCGCTACTTCATCCTGGCCAAGGCGGAGCAGGTGGCCCTGGTCAGGCGGGCTCCAACTTCACCACCCCAGGGCGCCGTGAAGGC
CGCTGCTGGGCGGCATCATCGGCCAGCAGGAGAGTTCGGCATCCCCTACAACCCCCAGTCGGCTGTGTTCATCCACAACGATGGCCGTCAAGGGCGGCATCGGCGCTACTCC
GCCGGCGAGGCGGCATCATCCGAGATCGTGGCCCTCCCGACAATCAGCTGCTCCGGCGTGTACTACCGCGA
CTCCCGGCGGAAGATCATCTGAAGGGCCGACTACGGCAGGCAAGCAGATGGCCCGGCCGGCGACGACGAGGACTAA
```

Fig. 123A

80. 2003_CON_08_BC pol.PEP

FFREILAFPQGEAREFPPEQTRANSPTSRELQVRGDNPSSEAGTERQGTLNFPQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEVNLPG
KWKPKMIGGIGGFIKVRQYEQIPIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKA
LTAICDEMEKEGKITKIGPDNPYNTPIFAIRKKDSSKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFR
KYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLKWGFTTP
DKKHQKEPPFLMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAENREI
LKEPVHGAYYDPSKELIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVIWGKIPKFRLPIQKETWETW
WTDYWQATWIPEWEFVNTPPLVKLWYQLEKDPIAGVETFYVDGAANRETKIGKAGYVTDRGRKKIVSLTDTTNQKTELQAIYIALQDSGSEV
NIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKERVYLSWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHEKYHSNWRAMASD
FNLPPIVAKEIVASCDQCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIHTDN
GSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKLIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIATDIQ
TRELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIKDYGKQMAGADCVAGRQDEDS

Fig. 124A

81. 2003_CON_10_CD pol.PEP

FFRENLAFQQRKARELPSEQTRANSPTSRELRVWGGDNTLSETGAERQGAVSLSFPQITLWQRPLVTVKIGGQLKEALLDTGADDTVLEEMN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGYKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISRIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLYE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEMVIYQYMDDLYVGSDLEIGQHRIKIEELRGHLLKWGF
TTPDKKHQKEPPFLMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPHKNLKTGKYAKRRTAHTNDVKQLTEAVQKIAQESIVIWGKTPKFRLPIQKETW
ETWWTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVISITDTTNQKTELQAINLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHNNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEALHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVVH
TDNGSNFTSAAVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAT
DIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKVKIIKDYGKQMAGADCVASRQDEDQ

Fig. 123B

2003_CON_08_BC pol.OPT

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TTCTTCCGCGAGATCCTGGCCTTCCCCCAGGGCGGAGGCCCGCGGAGTTCCCCGAGCAGACCCGGCCCAACTCCCCACCTCCCGCGGCCTGCCAGTGCCG
CGGCGCAACCCCTCCTCCGAGGCCGGCACCCGGCAGGGCCCTGAACTTCCCCAGATCACCCTGTGCCGGCAAGTGGAAGCCCAAGATGATCGGCGGC
GCGGCCAGATCAAGGAGGCCCTGCTGGACACCGGCCGCGCACCGGGCGAGACCAGATCCCATACGGCAAGAAGGCCATCGGCACCGTGCTGGTGGCCCACCCCGTGAA
ATCGGCGGCTTCATCAAGGTGCGCCAGTACGAGCAGATCTGGGCAAGATCTGCCCCTGAACTTCCCCATCTCCCCATCTCCCCTGAAGCTGAAGCCCGGCATGGACG
CATCATCGGCCGCAACATGCTGACCCAGCTGGGCTGACCAGCCAGCCGAGAAGATCAAGGCCCTGACCGGCGAGGAGGAAGATCACCAAGATCGGC
GCCCCAAGGTGAAGCAGCAGTGGCCCCTGACCGAGAAGATCAAGGCCCATCTTCGCCATCCGCAAGAAGACTCCTCCAGTGGCGCAAGCTGGTGGACTTCCGCGACTGGAACAAGCGCACCCA
CCGGACAAACCCCTACAACACCCCCACCCCCGCCTCCCCATCCGCAATCCCCCGCGCCTTCACCATCCCCCGTGAACAACGAGAAGAAGTCCGTGGGCGACGCCTACTTCTCCGTGC
GGACTTCTGGGAGGTGCAGCTGGCAAGTACACCACCGCCTTCACCATGCCCCCGCCCAGAATCCTGGAGCCCTTCCGCAAGCAGAACCCGGCCCTGCTGGACACGTGCTGTCCAGTACGACGA
CCCTGGACAAGGACTTCCGCCAGATCTTCAGTGCTCCATGACCAGCGTCCCCAGATCGGCGAGCACCTGCTGGAACTCGTGATCTACCAGCAACCCCCGACAAGA
TGGAAGGGCTCCCCCCGCCATCTTCCAGCTTCTCTGCGGCTGGCCCTGGAGAGCACCCCCGACAAGTGCCGAGCACCTGCTCCGAGAAGGACTCCTGGACC
CCTGTACGTGGGCTCCGACCTGGAGAGTCCGGATGGGCTACGAGCTGAACTGGCAAGCTGAACTGGGCCTGCCCCCGACAAGTGCTGTGCCAGGCGCCTACTACGACC
AGCACCAGAAGGAGCCCCTTCCTGTGGGCAAGCTGGTGCCCGTGACCGAGACCGGCCTCGAGGAGCACCCCGTGCAGCCGCCTTCAAGAACCGGCCAAGTAC
GTGAACGACACCATCCAGAAGCTGGTGGCCCCTGACCGTGCCCGAGATCTACCCGGCATCAAGGTGGCGAGATCTGGGCCTGTGCCAGGCGCAGATCCCCAA
GGCCCTGACCGAGATCGTGCCCCTGACCAAGGAGGCCCAGCTGGAGCTGGCCGAGCTGGCCGCAGGCCAGGGCCGTGACCGGCCTCCGGCAAGATCCCCAA
CCTCCAAGAGGCTGACCGCGCCACCCAGAAGGAGCAGGGCCAGGAGCAGCTGAAGCAGCGTGACCAGCTGGACGAGGTCCGTGACCGCCTTCCATCCTGGGCGAAGATCCCCAA
GCCAAGATGCGCACCGCCACCCAGAAGGAGCAAGATCATCCTGCCCCTGGAGAAGGACCCCATCGGCGGCGTGGACGGCGACCTTCTACGTGGACGACCTTCTACGTGGACCC
GTTCCGCCTGCCCATCCCAGAAGGAGACCTGGGAGAACCTGGACGACCTGCTGGACGAGGTTCGTGAACACCCCCCCC
TGGTGAAGCTGTGGTACCAGCTGGAGAAGGACCCCATCGCCGGCGTGGACGGCGACCTTCTACGTGGACGGCCTGCGCAAGGGCCAAGGCC
GGCTACGTGACCGACCGGCGGCCGCGCCGAAGAGATCGTGTCCCTGACCGAGACCACCAACCAGAGACACCAGAGACCCGGCCATCTACGTCCCCTGCAGGACTC
CGGCTCCGAGGTGAACATCGTGACCGACTCCCAGTACGCGCTGGGCATCATCCAGGCCCAGCCCGGCATCGGCCTGGTGTCCAACCAGATCATCG
AGCAGCTGATCAAGAAGGAGAAGGTCTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGGAGTACCACTGGCCGCAAGTGGTGTCCAACCTGCCCCC
CGCAAGGTGCTGTTCCTGGACGGCATCGATAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCGCCATGGCGGCGCAGGTGACCCAGGAGACC
CATCGTGCCCAAGGAGATCGTGGCCTCCTGCGACCTGTGGCCCGTGGCCCGTGACCGTGAAGGTGATCCACACTTCACCTCCCGGCCCGCGCCTGCTG
GCCTACTTCATCCTGAAGCTGGCCGGCCGCTGGCCCGTGACCGAGGTTCGGCCCGCATCCCCCCAGTCCCCAGTCCCAGGGGCGTGGAGGTCCAGGGGCCGTGAGAAGGCCGTGATCGGCCAGG
GTGGGCCGGCATCGCCAGGAGTTCGGCATCCCTTACAACCCCCAGTCCCAGTTCCATGAACGAGGGGCCGGCATCGGCGGCTACTCCGGCCGGGCGAG
TGCCGCGGACCAGGCCGAGCACCTGAAGACCGCCAGTGCTGCCCACAACTTCAAGCGCAAGGTCCAGGGAGCTGAAGAAGATCCAGAATCCAGGACAACTTCCGCGTGTACTACCGCGACTCCCGCGA
CGCCATCCTGGGCACATCGGCGGCAGCGGCTACACCTCCTGTTCATCCAGAGAGCAGATCATCAGAGATCAGGATCAGGAGGACAACAATCCAGGAGACGAGGAGGACTAA
AGATCATCAAGGACTACGGCAAGCAGATGGCCGGCGCCGACTGCGTGGCCGGCCGAGGAGGGGCCGGCGTGCCCCGCCCAAGGCCA
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Fig. 124B

2003_CON_10_CD pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGCGCCAAGGCCCGCGAGCTGCCCTCCGAGCAGCACCCGCGCCAACTCCCCCACCTCCCGCGAGCTGCCGCGTGTG
GGGCGGCGGACAACACACCCTGTCCCGCGAGACCGTGCTGCAGGCGCGGCCGCGAGCCGCCGGTGTCCCTGCCTTCCCCTGTCCCGCAGATCACCCTGTGGCACGCCCCTGTGGTGACCG
TGAAGATCGGCGGCGGCCAGCTGACCTGAAGGAGGCCCTGCTGGACACCGGCCGCGACGACACCGTGCCCGGCCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTAGGTCCTGATCGGCTGCCGGCCAGATCCTGATCGAGATCGGCTACAAGGCCATCGACGACCGTGCCCGTGGCTGGGCCCCAC
CCCCGTGAACATCATCGGCCAGACCGCAACCTGCTCGACCCCAGATCGGCTGCCGAGGAAGATCAAGGCCCTGACCGAGATCTGCACGAGATGGAGAGGCAAGATCTCC
GCATGGACGGCCCCAAGGTGAAGCAGTAGGCCCTGACCGGAGGAGAGATCAAGCTCTCGCCATCAAGAAGAAGAGACTCCACCAGTGGCCAAGTCTGGTGGCCGTGGGAGCTGGGCGACGCCTACT
CGCATCGGCCCCGAGAACCCCTACAACACCCCATCTTCGCCATCCACCCCGCGGCATCCCACCCCGTGGGCATGGGCAGCTGGCGGAGGTGCAGCTGGCGCAGCTGGTGGACGCGCCTACT
GCGCACCCAGGACTTCTGGGAGGTGCAGCTGGCAGCTGGGCATGGGCAGCTGGGGGCGGAGGTGCAGCTGGGAGGTGCAGCTGCTGCTGGGAGGTGCAGCTGCTGCTGTGCTGCT
TCTCCGTGCCCCGTGTACGAGGACTTCCGCAAGTACACCCCCCTCACCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAGAACCCCGGAGATGGTGATCTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCTCCTGACCCTGGAGCTCCGACCTGGGCTCCGACGTCTGGGCTGTCGTGTGGGCTTCACCACCC
CATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCATCAAGATCGAGGAGCTGCGCGGCCACCTGCTTCGAAGTGGGCTTCACCACCC
CCGACAAGAGCACCAGAAGGAGCCCCCCTTCCTGTGTGAGGCTACGACTGCACCCCGACAAGTGCAGCCCATCCAGCTGCCCGAGAAGGAC
TCCTGGACCGTGAACGACATCCAGAAGCTGAACTGGGCCTGGCAAGCTGAACTGGGGCCTGCAAGCTGAACTGGGCATCAAGGTGCCGTCCCGGCATCAAGGTGCGCCAGCTGCTGCGG
CGGCGCCAAGGCCCTGACCGGCCGGGCATCGTGCCCTGACCGAGGAGCCCGAGCTGGACCGTGCTGGAGCTCTGGCGGGCCCGTGCACGGCGTGT
ACTACGACCCCTCCAAGGACCTGATCGCCGCCCAGATCCTGATCGCCGCCCAGATCCAGAGGCCCAGGGCCAGGGAGGGAGTCCCCACAGAACCTGAAGACC
GGCAAGTACGCCAAGCCCGCCACCCCAACCGCCGCCCAACAAGGAGATCGCCCTGAAGGCCGTGACCAGCAGTCCATCGTCGTGATCTGGGGCAA
GACCCCCAAGTTCCGCCGTGGTGGTACCAGCTGGCGGAAGGAGCCCCATCGTGGGCGCCGCCATCACCGACAAGACCCCGATCCCCGAGTGGGAGTTCGTGAACA
CCCCCCCCTGGTGAAGCTGTGGTACCGCTGGGTGACCGGCCGCGGCAAGGCCCTGACCGTCCATCACCGACAAGTGCCGCCCATCAACCTGCCCT
GGCAAGGCCGGCCTACGTGCTCGGCGAGTGAACATCGTGACCGAGCTCCGCCCGTGACCTGGGCATCATCCAGTACGCCCTGGGCCGCGGTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTCGGTACCTGTCCCGGTGCCCGCCAGAGGCCCAGGAGCACGAGAAGTACCACCAAGAACAACTGGCGCGCCAACAAGCTGGTGTCC
TCCGGCATCGTCAAGGTGCTGTTCCTGACGCGGCATCGCCATCGACGGCCATCATCGGCGCCGGCCATCATGACCAAGCTGCGCGCCTCCCCCGGCATCT
CCTGCCCCGTGGTGGCCAGCTGCGTCTCTGCGACAAGTCGTGCGGCAAGTCGTGCAAGTGCGGGCCTCGGCCACCGGTGGTGCACCTCCCACCGAGGGGCTCCAACCTTCACCTCCCGCCGTGAAGGC
CAGGAGACCGGCCTACTTCCTGCTGCTGAAGCTGACCGGAGCTGCAGCTCGGCCGGTGGTGCACCCCCAGTCCCAGGGCCGTGGTGGAGTCCCCAGTCCCAGGGGCCGTGGTGGAGTCCCCAGTCCCGTCCGT
CGCCTGCTGGTGTGGGCCCGGCATCAAGCAGGAGTTCGGCGATCAAGCAGGCCGTGGCCATGAACGCCAAGGGGCGGCATCGGCGGCTACTCC
TCGGCCCAGGTGCGGCGACCAGCCCAGCACTCGACATCATCGACATCGACAATCGCCCAAGGCCCTGAAGAGCTGCAGAAGCAGATCCAGAACTCCAAGGAGACTTCGCGCATCAAGGTGTACTACGGCGA
GCCGGCGAGCGCCATCATCGACAATCATCCCCGAAGGGCGCCCCCCAAGCAGTGCGCGCATCAAGCAGCTGCAGAAGCAGATCCAGGAGACCAAGAGCTGACTCAAGATCAAGGAGACTTCCGCGTGTACTACGGCGA
CTCCCCGCGACCCATCCTGACCGAGGAGAAGGCGCGAGGCGCCCAAGCTGCTGTGGAAGGGCGAAGGGCCCGTGGTGTGCTGTACTACCGCGGA
GCAAGGTGAAGATCAATCAAGAACCTACGGCCAAGCAGCAGATGCCCAAGCTGCGCGGCCGACTGCGCCATGATGGCCAAGCAGCAGATGCCCGAGTCCCCGCCAGGACCAGGAGGACCAG
```

Fig. 125A

82. 2003_CON_11_CPX_pol.PEP
FFRENLAFQQGEAREFSPEQARANSPTSRELRVRGGDSPLPETGAEGEGAISFNFPQITLWQRPLVTIKVAGQLKEALLDTGADDTVLEEID
LPGRWKPKMIGGIGGFIKVRQYEEIIIEIEGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIDTVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
SERKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTQNPEIVIYQYMDDLYVGSDLEIGQHREKVEELRKHLLKWGF
TTPDKKHQKEPPFLMWGYELHPDKWTVQPIQLPDKECWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGTKALTDIVPLTAEAELELAEN
REILKEPVHGVYYDPSKDLIAEVQKQGLDQWTYQIYQEPFKNLKTGKYAKRRTAHTNDVRQLAEVVQKISMESIVIWGKIPKFRLPIQRETW
ETWWTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIIGAETFYVDGAANRETKLGKAGYVTDKGRQKVVTLTETTNQKTELEAIHLALQDSG
LEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIAT
DLQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 126A

83. 2003_CON_12_BF_pol.PEP
FFRENLAFQQGEARKFPSEQARANSPASRELWVRRGDNPLSEAGAERRGTVPSLSFPQITLWQRPLVTIKVGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVKQYDNILIEICGHKAIGTVLVGPTPVNIIGRNLLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQHLLRWG
FTTPDKKHQKEPPFLMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCRLLRGTKALTEVIPLTKEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKITTESIVIWGKTPKFRLPILKET
WDTWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIAGAETFYVDGASNRETKKGKAGYVTDRGRQKAVSLTETTNQKAELHAIQLALQDS
GSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSAGIRKILFLDGIDKAQEHEKYHNNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYLEAEVIPAETGQETAYFILKLAGRWPVKTI
HTDNGPNFSSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIRQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIS
TDIQTRELQKQIIKIQNFRVYRDSRDPVWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 125B

2D03_CON_11_CPX pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGCGGAGGCCCGCGGCCAGCAGGCCCGCCAACTCCCCGCCAACTCCCCGGAGCCGGGCGCTGGGCGTGGCG
CGGCGGCGGACTCCCCCCTGCCCCGAGACGCCGGAGGGGCGGCGGCCGAGGGCGAGGGCGGCGGCCATCTCCTTCAACTTCCCCAGATCACCCTGTGGCAGCGCCCCCTGGTGACCA
TCAAGGTGGCCGGCCCAGCTGAAGGAGGCCCTGCTGGACACCGGCCCTGCTGGAGGAGATCGACCTGCCCCGGCCGCTGGAGCCCAAGATG
ATCGGGGCATCGGCGGCTTCATCGGGGCTTCATCAAGGTGCGCCAGTGACCCAGTACGAGGATCATCATCGAGATCGGCTGACACCCGTGCTGGTGGGCCCCAC
CCCCGTGAACATCATCGGCCCAACATGGCCCAACCAGATCGGCTGTGCCCCTGACCCAGCTGAAGCCCTGACCGAGATCAAGGCCCTGACCGAGAGAGATCAAGGCCGGGCAAGATCTCC
AAGATCGGCACCCGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCAAGCTGGTGTGGACTTCCCGAGCTGAACAA
GCGCACCCCAGGACTTCTGGGAGGTGCAGCTCCTGGGCATCCCCCACCCCGCCGCCTGAAGAGAAGAAGTCCGTGACCGTGGGCGACGCCTACT
TCTCCGTGCCCCTGACGAGTCCTTCCGCAAGTACACCACCCGCCTTCACCATCCCCATGACCAAGATCCTGGAGCCCTTCCGCACCCAGAACCCCACCCCGAGATCGTGATCTACCAGTA
CATGGACGACCTGTACGTGGGCTCCGACCTGGCCCAGCTGCGCCAGCACCTGCGCCAAGCACCTGCTGCGCCAAGTGGGCTTCACCACCC
CCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCGTGCTGCCCGAGAAGGAG
TGCTGGACCGTGAACGACGACATCCAGAAGCTGGTGGGCCCTGACCTGGGCCTCCGAGCTGAACTGGCCGAGCGCCGAGGAGTCTGGAGCTGCCGTGCACGCGGTGT
CGGCACCAAGGCCCTGACCGAGGTCCCGCCCGAGGTGCAGAAGCAGCAGGGCCTGACGAGCAGTGGACCTACCAGATCTACCAGGAGGACGCCCTTCAAGAACCTGAAGACC
ACTACGAGCCCCTCCAAGGAGTGATCGCCGCACCGCCCCACAACGACGTGCGCCGAGGTGTGCCAGAGATCTCATGGAGTCCATCGTGATCGTGGGGCAA
GATCCCCAAGTTCCGCCTGCCCATCCAGCGCGAAGACCTGGGTGGAGACCTACTGGACGGCCCACCTGGACGCGCCCGAGACCTTCTACGTGGGAGTTCGTGAACA
CCCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCATCGGCCAAGAAGGTGGTGACCCAGAAGACCAGAGACCCCGACCAAGCTG
GGCAAGGCCGGCTACGTGACCGACAAGGGCCGCGACAAGGTGGTGCCCCTGACCAGCTGCCAGTCCCAGTCTCCAGCTGCGGTGTCCC
GCGAGGACTCCGGCTGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCTGACAGTCCCAGGTGGACAAGTCCGAGCTGGTGTCCC
AGATCATCGAGCAGCTGATCAAGAAGGACAGAGAGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGAGCATCGGCGCTGGTGTCC
TCCGGCATCCCGACCGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCCATGGCCCTCCGACTTCAA
CCTGCCCCCCATCGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGTGCCAGTCCATGGCCAGTGACTGCTCCCCGGCATCT
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCCGTGCACGTGGCCAGCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACCGGC
CAGGAGACCGCGCAGTTCCTGCTGAAGCTGGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACTTCACCTCCCGCCCCGTGAAGGC
CGCCTGCTGGGCTGGTGCGCGCCTTCGGCGTGCCCCACAACATCCAGAGCCAGTTCGGCATCCCCTACAACCCCCAGAGCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGCCAGGTGCGGGACCAGGCGCAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTACTCC
GCCGGCGAGCGACCTGTGGACATCTGGCGGAAGGGCCCCGCGACTACGGCGCAAGCAGATGGCCGGCGACTGCGTGGCCCGCCAGGATCAAGCAGCAGATCCCGACCAACTCCGACATCAAGGTGGTGCCCCGCC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCAGCCGCCAGGATCAAGCAGATCCCGACCAACTCCGACATCAAGGTGGTGCCCCGCC

Fig. 126B

2003_CON_12_BF pol.OPT
TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCCCGCGAGGCCGAGGCCCGGCCCGGCCAGTTCCCCTCCGAGCAGGCCCGGCCCAACTCCCCGCCTCCCGGCAGCTGTGGGTGCG
CCGCGGCGGACAACCCCCTGTCCGAGGGCCGCGCCGAGGGCCGCCGGAGGGCCCTGCTCAGCTGCACCCTGGACAGGGCCCTGTTCCCCGAGATCACCCTGTGGGCAGCAGCCCTGGTGA
CCATCAAGGTGGGCGGGCGGCCATCGGCGGCGGCTTCATCAAGCTGAAGCAGTACGACAACATCCTGATCGAGATCCTGACCCTGAACTTCCCCATCGAGACCGTGCCCGTGAAGCTGAAGC
ATGATCGGCCGGGCGCATCGGCGGCTTCATCGCCGCCAACCTGCTGCTGACACATCGCGCGCCAGCTGGCTGAAGGTACGACAACATCCTGATCGAGATCCTGACCCTGAACTTCCCCATCGAGACCGTGCCCGTGAAGCTGAAGC
CACCCCCCGTGAACATCATCATCGGCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
CCGGCATGGACGGCCCCAAGGTGGAAGCAGTGGCCCCTGACCGAGGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCGGAGAACCCCTACAACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCCCAGGACTTCTGGGAGGTGCAGCCTGAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGCCCT
ACTTCTCCGTGCCCCTGGACAAGGACTTCCGCAAGTACACCACCGCCTTCACCATCCCCTCCGTGAACAACCCCGGCATCCGTACCAGTACAACGTG
CTGCCCCCAGGGCTGGAAGGGCTCCCCGCCCATCTTCCAGTGCCTCCATGACCAAGAGTCTGAGGAGCTGCGCAGCACCTGCTGCGCCTGCT
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGACGGAGAGCTGCGCCAGCAAGTGCACCCGGCATCAAGGTGACCCCGAGAAG
CCCCCGACAAGAAGCACCAGAGAAGGAGCCCCCTTCTGTGGATGGGCAAGCTGACCTGAACCTGGGCCTCCCCAAGCTGTGGCGCCTGCT
GACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCCAAGCCCTGATCCCCCGGCCACCAAGGCCCTGATCCAGAGATCCTACCCCGCGCTGCACGGCG
TGTACTACGACACCCCTCCAAGGACCTGATCGCCGCGCGCCCCACAACCAGCTGACGATCTACTACCAGGAGATCTACTACCAGGAGGACACCACCGAGACCTGAAG
ACCGGCAAGTACGCCCCGCATGCCGCCCCCAGAACCAGCCAACCAAGCAGTGAAGCAGTCGGCCCCGGCCAGTGTGATCTGGGG
CAAGACCCCCAAGTTCCGCCTGCCCATCCTGAAGGAGACCTGGTGTGACAACCTGGTGACTCGGGACCTGGGACACCTGAGTGGGAGTTCGTGA
ACACCCCCCGTGGGTGAAGCTGTGGTACCAGCTGGTACCAGCCCCATCGCCGGCGAGACCTTCTACGTGACGCCCCGAGACCAAG
AAGGGCAAGGCCGGCTACCGTGACCGCCGCGGCCGCGCCCGGACGAGGCCGGGCTACCAGAAGGCCCGAGCTGCACGCCCGAGCTGGTGA
CCTGCAGGACTCCGGCTCCGAGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGTGCCCCGGCCCAGGAGGCCCCCGGCGGCAAGCTGGTG
ACCAGATCATCGAGGCAGCTGATCAAGAAGGAGAAGGTGTACCCTGACGGGCATCGAAATCTTGACGGCGCATCGACAAGTGCCCCATGGCCTCCGACTT
TCCGCGCGGCATCCGCAAGATCCTGTTCCTGGACCACAAGATCGTGCCCGCAAGGGCCAAGATCATCCTGGAGGGCAAGATCCTGAAGCTGCCCGGCA
CAACCTGCCCCCCGTGGGTGGCGCCCTACTTCTCATCCTGGCCGCGCCTCGATCCTGGAGGGGCCTTCGGTGCTGAGTGGTGATCCCCGGCCGAGACC
TCTTGGCAGCTGGACTGCACCCAGTTCGGACGAGGGTTCGGCCCCCGTGCCCGGCCCCCCCAGTGCCGCGCTGGGCCCCACCCCCACCCGCCTCCCGCCGTGAA
GGCCAGGAGACGACCGCTACTTCAGGACGCTGGAGGGGCATCCAGGCCGTCCAGGCCCCGCCATCCACCACCCCCAGTGGTCGCGGGCATCGGCGGCTAC
TCATCCGCCGCGCGGAGTTCGGCGCACCAGGACGCGCCGCTGGAGGCGCTGAGAAGCAGCAGCAGATCATCAAGATCCATCAAGATCCAGAACTCCGCCGTGTACTACCG
CGACTCCGGCCGACCCGTGTGGAAGGGCGCTGTGTGGAAGGGCCGCCCGACTACGGCAAGCTGGTGGTCGGCGGGCGAGATCCCAGATCCGAGATCATCCCAGAGAAGGTGGTGCCCC
GCCGCAAGGCCAAGATCATCCGCGACTACGGCAAGCTGGTGGTGAGATGGCCGCGCGACTGCGTGGTGAAGGTGGTGCCCCAGGCCAAGATCCAGAGATCCGAGGACGACTAA

Fig. 127A

84. 2003 CON 14 BG pol.PEP
FFRENLAFQQGEAREFSPEQARANSPTRRELWVRRGDSPLPEARAEGKGDIPLSLPQITLWQRPLVTVRIGGQLIEALLDTGADDTVLEDIN
LPGKWKPKMIGGIGGFIKVRQYDQILLEICGKKAIGTVLVGPTPINIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTDICTEMEREGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPSGLKKKKSVTVLDVGDAYFSVPLDE
SFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRIKNPEIVIYQYMDLYVGSDLEIGQHRAKIEELRKHLLSWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKESWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAEN
REILKEPVHGVYYEPSKELIAEVQKQGLDQWTYQIYQEPYKNLKTGKYAKRGSAHTNDVKQLTEVVQKIATESIVIWGKTPKFKLPIRKETW
EVWWTEYWQATWIPDWEFVNTPPLVKLWYRLETEPIAGAETYYVDGAANRETKLGKAGYVTDKGKQKIITLTETTNQKAELQAIHIALQDSG
SEVNIVTDSQYALGIIQAQPDRSESEVVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKIIH
TDNGSNFTSAAVKAACWWANITQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYFRDSRDPIWKGPAKLLWKGEGAVVIQDNNEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

SUBSTITUTE SHEET (RULE 26)

Fig. 127B

2003_CON_14_BG pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGAGTTCTCCCCGAGCAGGCCCGGCGCCAACTCCCCACCCCGCGCGCCGAGCTGTGGGTGCG
CCGCGGGCGACTCCCCCCTGCCCGAGGCCCGCGCCGAGGGCCAAGGGCGCCAGATCCCCCCTGTCCCTGCCCCAGATCACCCCTGTGGCAGGCCCCCTGGTGACCG
TGCGCCATCGGCGGCCAGCTGATCGAGGGCCCTGCTGGCCCGGACACCGTGCTGGAGGACATCAACCTGCCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGATCGAGGATCTGGGCGGCAAGAAGGCCATCGGCACCGTGCTGCCGTGCTGGTGGGCCCCAC
CCCATCAACATCATCGGCCGCCAACATGCTGACCCAGATCGGCTGCCCCTGAACTTCCCCATCTCCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCCCG
GCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGACATCTGCACCGAGATGGAGCAGGGCCAAGATCTCC
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